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of Freight Trains . . .**

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No "Plan" Is Any Good Unless It Increases Earnings

The behavior of many political and business leaders toward the situation of the railroads is a good deal like that of a man who suspects that a sore on his lip is a cancer—but is fearful of going to a competent surgeon lest his suspicions be confirmed, and he will have to submit to an operation. So he placates his fears and his wife, by each day bringing home a new brand of salve with which he anoints the growing lesion. Such behavior is human and understandable—but it is not the procedure of an intelligent adult, and it is not behavior which promotes the health of the weakling who pursues it.

Should Railroad Plant Be Shrunk 70 Per Cent?

The basic "lesion" of the railroad situation, which no palliative salve in the form of superficial revisions in railroad financial practices can assuage, is the inadequacy of net operating income to support a railway system of the size and efficiency which the American people require if the nation is to prosper. In 1938 the railways earned net railway operating income of 373 million dollars. In the relatively prosperous year 1937 their net railway operating income was only 590 millions. Striking an average of a relatively "good" and "bad" year, we get 482 million dollars of net earnings. Such net earnings represent a return of 6 per cent on an investment of only 8 billion dollars, which is less than 30 per cent of the actual investment of more than 26 billion dollars in railroad property, and represents a return of 5 per cent on an investment of less than 10 billions.

Some superficial and myopic observers—among them, notably, Senator Wheeler and John T. Flynn, the popular writer on economic questions—see a trip "through the wringer" as the primary need of the railroads. That is to say, they profess to see a solution to present difficulties in scaling down the capitalization of the carriers to correspond with the extent to which the public no longer requires their services. Granting for a moment the principle of this contention, let us see where this leads us. In 1937 public utilization of the services of the railroads, as measured in freight ton-miles, was approximately 80 per cent of such utilization in 1929.

Granting for purposes of the argument that the rail-

roads are less a necessity to some branches of the American public at the present time than they were in 1929, and also granting the extremely doubtful assumption that 1937 offered a true measure of the transportation requirements of the American people under conditions of "normal" prosperity—it is still evident, despite all these concessions to the "wringer" advocates, that a shrinkage of railway property and capital of not more than 20 per cent is justifiable. That is to say, even if 1937 provides a measure of the present maximum requirements of the American public for railroad service (which we strongly doubt), then America still needs four-fifths of the railroad property that it had in 1929, which would mean a property investment of more than 20 billion dollars.

Public Cannot Continue Getting More Than It Pays For

The core of the railroad problem lies in the fact that, while the American public requires a railroad plant involving an investment of not less than 20 billion dollars, it is currently paying an adequate "wage" to less than half of the dollars it has "hired" to work for it in railroad service. The result is that new dollars are refusing to go to work where the "wages and working conditions" are so unattractive. No one can successfully defend a contention that the nation needs a railroad plant involving an investment of appreciably less than 20 billion dollars, and no one can deny that to attract and maintain such an investment, net earnings of more than 1 billion dollars annually are required. And present annual earnings are averaging only about half of that.

There are countless ways in which railroad service and efficiency and financial practices could be improved—and the same statement would be true of any other business or occupation, including that of government. But none of these suggested improvements can have the slightest significance in advancing the interest of society in the maintenance of efficient railroad service except in so far as they promise to add to net railway operating income. The railroads need, on the average, upwards of 500 million dollars of net railway operating income more than they are now earning. Thus, any scheme put forward to solve the railroad "problem" may be

quantitatively evaluated in relation to that requisite minimum of 500 million dollars.

An Infallible Test for a Railroad "Plan"

The proposed doing away with land-grant rates, for instance, is estimated to yield approximately 10 million dollars annually—which means that such a measure would solve $10 \div 500$, or 2 per cent of the railroad problem. The railroads in 1937 paid 537 million dollars in maintenance, carrying charges and taxes on their roadway. The government furnishes other carriers their roadway free in return for the tax levies they pay on their vehicles. The government could decide to make other carriers pay the full cost of their use of the highways it now furnishes them. Or the government could decide to assume for the railroads the 537 million dollars annually that it now costs them to furnish their own highways, which it is obvious would just about satisfy the railroads' need for greater net railway operating income. We do not advocate such a policy but rather that the favors, in respect of both regulation and subsidies, now extended to competing agencies of transportation, be removed. But, just the same, a proposal to indemnify the railroads for their roadway expense would be a proposal really to solve the railroad problem, and would be only fair as long as government furnishes other carriers their roadways.

But now, having looked at a few forthright steps which would deal basically in whole or in part with the real difficulties of the railroads, let us turn for a moment to a few of the phony "salves" which will not arrest the disease in the slightest, and which only serve to fool people into thinking that a "cure" is in process when it is not. As we said above, a phony "salve" of this kind may readily be detected by the fact that it will add nothing to net railway operating income. Any proposal having to do with the railroads can be evaluated for genuineness by seeing whether it will add to net railway operating income or not; and a definite percentage evaluation of its adequacy can be derived by dividing the proposed addition, if any, which it will make to net railway operating income, by the 500 millions of additional net revenues which the railroads need in order to maintain the minimum railway plant required by public need. Let us, then, apply this simple and infallible test to the proposals which Senator Wheeler has been turning out at the rate of one or two a week for the "solution" of the railroad "problem." Let us apply it also to the bill he has introduced in the Senate to regulate the purchase by railroads of stocks in other companies.

Wheeler's Proposals Flunk the Test

The application of this test to Senator Wheeler's proposals indicates that none which he has yet brought forward would serve to correct the basic difficulties of the railroads one iota. That there has been in the past

a small amount of unwise and even anti-social trading in railroad securities is true, but that such trading is, even in infinitesimal degree, responsible for the present reluctance of investors to invest more money in the railroads, is an absolutely ridiculous assumption. At least two of the companies, those in control of which are most criticized by Senator Wheeler and a repetition of whose actions he seeks to prevent by legislation, happen to be among the relatively strongest, financially, of the country's railroads. And, of course, there are scores of railroads either in bankruptcy or near it, in the conduct of the finances of which the Senator has been unable to find grounds for any sound criticism.

The investing public has shown time and time again that it is willing to put its money into enterprises which are earning money—trusting to luck and the criminal laws to protect it from losses by crooked practices. If Senator Wheeler's course of action had any basis in fact, what we should expect to see would be that the credit of the roads whose managements he criticizes would be bad, while that of the carriers with whose managements he can find no fault would be good. Actually, however, we find the credit of the whole industry at its lowest ebb—with relatively good showings for some of the companies in which he detects the gravest faults, and extremely bad showings for many companies that he does not attack specifically at all.

The fact of the matter is that the Senator's proposals are wholly phony as far as dealing with the basic difficulty of the railroads (i.e., the lack of adequate earnings) is concerned. None of the reforms which he proposes would add so much as a dime to the earnings on the investment in railroad property; they would merely shuffle the measly incomes the railroads are now earning a little differently than they have been shuffled in the past. The figure of Nero fiddling while Rome was burning is an inadequate analogy for Senator Wheeler's course of action; because there was probably nothing Nero could have done to stop the fire, anyhow. But Senator Wheeler could do something about the railroad situation. No one, in fact, in the entire country is in such a relation of power and responsibility toward it as he and Representative Lea, because they are chairmen of the two congressional committees on Interstate Commerce, and the railroads' inability to earn an adequate income is wholly of political origin.

Is There a Doctor in the House?

But no. The great surgeon has been called into operate upon the patient for cancer, and, instead of doing so, has thus far merely given him a shave. Which would not be so bad, because barbering is an honest calling—just as Senator Wheeler's proposals dealing with financial practices would not be without a modicum of merit at a less critical time. But the great surgeon has not told the public that it is whiskers only, and not the deadly sarcoma with which he was called in to deal, that he is proposing to remove.

Unless Burton K. Wheeler ceases his frivolous behavior with regard to this serious social problem, which is so definitely and almost uniquely his to solve, some day, when he has gone to his reward, there will be written a biography, an apt title for which would be, "The Tragedy of Burton K. Wheeler." The tragedy to be related will be that of a man who showed his greatness of intellect and courage in his battle against the court packing bill; but who quickly tired of, or was frightened at, an heroic role—and, hence lapsed back forever, into a petty political routine.

Mileage Limitation

A number of junior railway employees appeared at the Lea committee hearings last week to plead for the establishment by law of a limitation on the monthly mileage of train and engine service employees. The disposition of a good many people, including many railway managers, appears to be that this demand for mileage limitation is purely an intra-union scrap—and that it makes no difference to a railroad whether its train and engine service employees get in 26 "days" per month or 36, or even more.

We do not share this opinion. In the first place, in at least some of the unions, the cards are stacked against the junior employees. That is to say, when a man is furloughed, he loses his voting rights in the union. This means that the unions are run by and for the "old heads." The result is that union policy will favor a high limitation on mileage or none at all—when, as a matter of fact, except for the disfranchisement of the

junior employees, union policy might be quite different.

Among the many duties of railway management is the safeguarding of the rights of employees who, except for the interest of management in their lot, would have no spokesman at all. Therefore, on any railroad where there exists any considerable number of furloughed enginemen and trainmen, there would appear to be a moral obligation on the part of management to champion the cause of the unemployed and strive to secure agreement to the limitation of mileage to a reasonable maximum.

But even if management does not consider it a duty to risk offending the "old heads" by endeavoring to induce them to spread the work among their less fortunate brethren, it might at least lend a hand to the younger men by enforcing the limitations already agreed upon. According to our information, on many railroads the enforcement of such mileage limitations as exist is left entirely to the voluntary action of the employees themselves. At the very least it seems that, where the "old heads" agree to a limitation, they should be willing to live up to it; and hence could have no objection to enforcement by the railroad of the mileage limitation to which they have agreed.

All humane considerations apart, it is simply a matter of good business for railway management to show a reasonable degree of consideration for the well-being of employees who, in a few years, will be the regular employees entrusted with the operation of the railroads. And no injustice or hardship is involved in asking the "old heads" to accept a reasonable limitation of their mileage—because, even with such limitations, they enjoy earnings and leisure which would be the envy of many men of long experience in the learned professions.

Propaganda and Economics of "Diversion"

The Propaganda of "Diversion"

"More than one state has misappropriated highway funds to uses other than highway building, maintenance and amortization. That practice must stop. Public opinion is already confirmed against the diversion of highway funds. Governors are announcing themselves in increasing frequencies against diversion. State legislatures are ob-

*From a Speech by Chester Gray,
Director, National Highway Users Conference.*

viously more hesitant now than five years ago to misappropriate road funds no matter how worthy other projects might be. The federal government, several years ago, declared, in substance, that it is unethical for states to use road funds for any purpose other than for highways."

The Economics of "Diversion"

"If the entire state tax on gasoline were used for the benefit of the motorist, the motorist would not meet his obligation to the support of schools and other State institutions and departments.

"The next question arising is the much discussed proportion of applying the sales tax to the gasoline fund if the general revenues are insufficient to meet the appropriations. This is called by its opponents a diversion of highway funds, and those who oppose this policy style themselves anti-diversionists. This is a misnomer. They are really exemptionists. They are asking special favors for a special class and are seeking to change the law that has been in force for four years.

*Governor Hoey of North
Carolina in a Message to the N. C. Legislature.*

"Gasoline is not as essential as many other articles that pay their full share of sales tax for support of schools and other general fund purposes; for instance, necessary clothing and food articles other than exempt items.

"The issue, then, that is so generally presented as diversion, and as an injustice to the motorist, is more properly a demand for exemption of gasoline from the obligations imposed on other articles of commerce, and of special and favored treatment for it. It would be a complete answer to the diversion argument to suggest that even a contingent diversion can be avoided by repealing the exemption of gasoline from the general sales tax act."

What Will the Traffic Bear?—2

The initial installment last week of this *series of queries* discussed the opportunities which the railroads' rate structures and classifications of freight afford the trucks to pick and choose their traffic.

It was shown, because the railroad pricing structure makes the hauling of some commodities so much more profitable than others, that trucks unduly divert revenues away from the railroads by concentrating their solicitation on the tonnage that pays well, leaving the railroads the poorer paying business.

The maximum distance used in last week's examples was 200 miles. It was shown that clothing would earn the truck 140 per cent profit over and above costs for a 100-mile haul in certain areas, but that a similar shipment of glassware in certain other areas would bring in 20 per cent less than truck operating costs.

The discussion below considers the possibilities which the railroad pricing structure offers, permitting trucks to operate at a profit for distances as great as 1,000 miles.

Based upon truck operating costs of 20 cents per truck-mile and pick-up and delivery costs of 15 cents per hundred pounds, it will cost the average truck approximately \$445, including pick-up and delivery, to make the round-trip from New York to Chicago via Buffalo and Cleveland. If this truck handles 20,000 pounds of clothing on its out-bound trip and 10,000 pounds of dry goods on its return trip it will earn \$501, or a profit of 12 per cent above operating costs. If the truck is loaded with a similar amount of certain glassware it will earn only \$252 and will bring in 43 per cent less than its operating costs. But if the truck carries 20,000 pounds of the higher class of merchandise from New York to Albany, a similar load from Buffalo to Cleveland, a similar load from Cleveland to Chicago, and on its return trip, a similar load from Chicago to Cleveland, a similar load from Cleveland to Buffalo, and runs empty from Buffalo to New York, it will cost this average truck \$565 to make the round-trip, but it will earn \$1,058, and a profit of approximately 90 per cent above operating costs. This possibility of greater earnings because of combination handlings, which is being realized by the trucks, is due to the undue inflation in the short-haul structure, materially in excess of the cost of the additional terminal handlings involved. To illustrate:

First Class Rate Between	Cents
New York and Chicago	167
New York and Albany	73
Albany and Buffalo	96
Buffalo and Cleveland	79
Cleveland and Chicago	101
Total of Combination	349

This method of rate construction could be justified by commercial practices of the past, but today it would appear to be not only no longer useful to the railroads, but actually to their detriment.

It will cost the average truck \$410 to make the round-trip between New York and Atlanta, and the average earnings on high-grade traffic will approximate \$636, or 55 per cent profit. But if it handles shipments from New York to Baltimore, Baltimore to Richmond, Richmond to Charlotte, Charlotte to Atlanta, and on its return trip, from Atlanta to Charlotte, and Charlotte to Richmond, returning empty from Richmond to New York, the operating cost will be increased to \$530, but the revenue will also be increased to \$1,338, or 152 per cent in excess of the costs of operation.

The first class rate between New York and Atlanta is \$2.12, but the total combination of rates, using the intermediate points shown above, is \$4.14.

The round-trip cost of the average truck from Chicago to Dallas, Tex., is \$428, and the average earnings on high-grade traffic will approximate \$783, or 82 per cent profit, but if this truck handles shipments from Chicago to Burlington, Burlington to Kansas City, Kansas City to Oklahoma City, Oklahoma City to Dallas, and on its return trip, from Dallas to Oklahoma City and from Oklahoma City to Kansas City, and returning empty from Kansas City to Chicago, the operating cost will be increased to \$548, but the revenue will also be increased to \$1,514 and realize 176 per cent profit. The first-class rate from Chicago to Dallas is \$2.61, but the total combination of rates, using the intermediate points shown above, is \$4.72.

The trucks are taking wholesale advantage of these obvious inconsistencies in the present railroad rate structure. Of course, the average traffic will not net such fancy revenues and profits, but **the truck does not take the average traffic.**

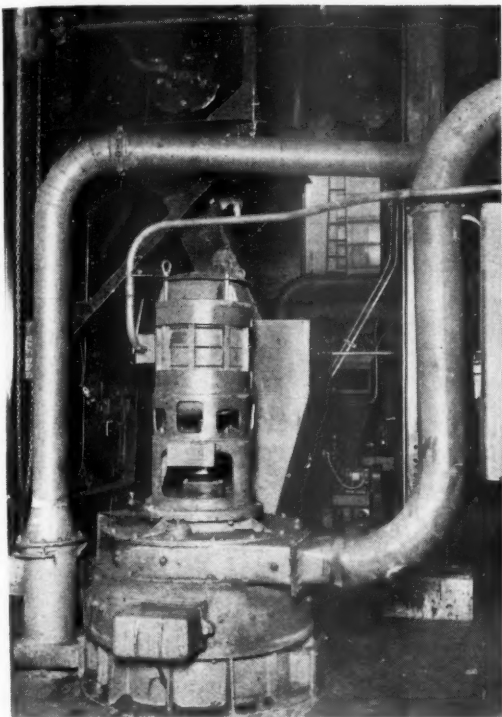
From a study of actual truck operating costs it appears that such costs are seldom lower than efficiently co-ordinated pick-up and delivery and rail costs for distances beyond 150 miles, and that the railroads can go far towards meeting such costs within the 150-mile radius.

If the rates on *competitive* traffic were based on the cost of handling, there wouldn't be any freight paying such fancy profits, and the trucks could take traffic away from the railroads only when their average cost of operation was lower than the railroad cost.

This is the second installment in this series.

The third will be published next week.

New Boilers Effect Economies on the Missouri Pacific



One of Vertical, Swing-Hammer Type Pulverizers

THROUGH the installation of pulverized-coal-fired boilers in its steam power plant at its car and locomotive shops at North Little Rock, Ark., the Missouri Pacific is now supplying the demands for steam at that point, which range from 9,000 lb. to 38,000 lb. and average 27,000 lb. per hr., at a saving of 9.17 cents per thousand pounds, as compared with the cost of steam developed by the equipment formerly in use. The new installation involves two new pulverized-coal-fired boilers, each with a normal rating of 515 h.p., which replaced five old oil-fired, small, horizontal-water-tube boilers, built in 1906.

Decided on Pulverized Coal

When it became apparent in 1937, that new boilers must soon be installed at North Little Rock, a study was made to determine which type would best supply the demands for steam at these shops. Because of increasing oil prices, consideration was given to the relative merits and economy of other kinds of fuel as compared with oil-fired boilers and, as a result of this study, the Missouri Pacific decided on the pulverized-coal-fired boilers.

In general, the new steam generating plant consists of two three-drum, bent-tube boilers housed in a brick building, each of sufficient capacity to handle the peak load at these shops when operating at 225 per cent of normal rating. The boiler furnaces have a combination of water and air-cooled walls, and air-cooled floors, the air employed in the wall cooling process being used subsequently for combustion. Pulverized coal, suspended in the primary air of combustion, is fed into each furnace through a burner nozzle. Two pulverizers, one for each

Pulverized-coal-fired units built at North Little Rock shops, replacing old plant, save 9.17 cents per thousand pounds of steam

boiler, pulverize the coal as it is used. The pulverizers are supplied from an overhead hopper, which is loaded by chain type bucket conveyors from a track hopper at the side of the building. The removal of the old boilers provided space for the two new boilers, with sufficient additional space for a third if future expansion or increased steam demand require another unit.

Design of New Boilers

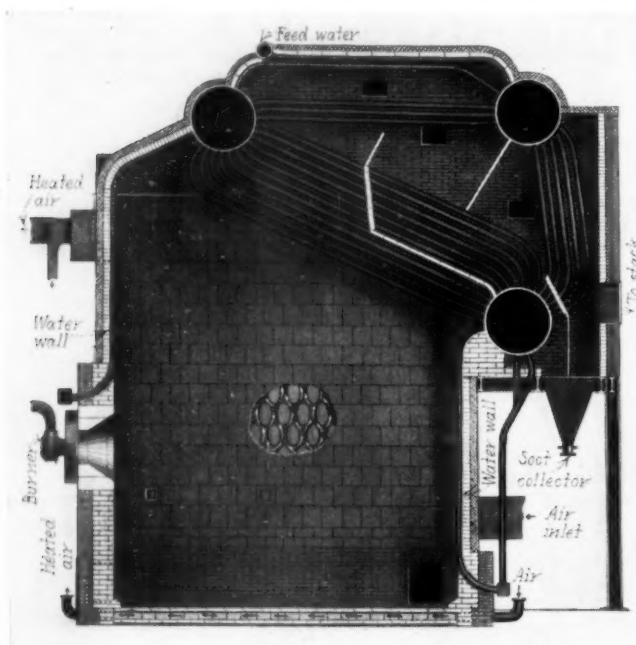
The new boilers are each of 515 h.p. normal rating, and each has 5,150 sq. ft. of tube surface plus 260 sq. ft. of water wall surface. The water walls, of which there are two, are located on the rear bridge wall, and on the top half of the front wall and perform the function of cooling those portions of the furnace walls.

Both furnaces, or boiler fireboxes, are approximately 18 ft. long by 10 ft. wide, with a volume of about 3,350 cu. ft. They are designed to give a heat liberation of 15,000 b.t.u. per cu. ft. at 225 per cent of normal boiler rating. The side walls and the floors of both furnaces, which have interlocking air spaces provided by a special refractory tile lining, are cooled by air forced through the air spaces in the tile by a fan located outside the firebox at the rear of the furnace. This construction permits the use of low ash fusing coals without excessive slagging of the walls and floor. Each furnace has 550 sq. ft. of side walls and 180 sq. ft. of floor area that are air cooled.

In the process of cooling the walls and floor, the air which is forced through them is heated to temperatures ranging from 250 to 350 deg. F. This preheated air is used for both the primary and secondary air of combustion. Approximately 25 per cent of the preheated air goes to the pulverizer, where it serves to dry the coal and to carry it in its pulverized state to the burner, while the remaining 75 per cent is introduced directly into the furnace around the burner as secondary air for combustion. This preheated air adds materially to the efficiency of the burner as it causes more rapid ignition than can be obtained with cold air.

The two pulverizers, one for each boiler, are of the vertical impact type. Each has a capacity of 4,000 lb. of coal per hour, and is driven by an electric motor mounted on top of the pulverizer housing, with the vertical shaft of the motor continuous with that of the pulverizer. In the heater chamber of the pulverizer,

the swing hammers revolve about the vertical shaft in a horizontal plane, and the coal and preheated air enter at the bottom. The coal is forced into the bottom of the heater chamber by a small screw-type conveyor with a feed range of 6 to 1 provided by a variable speed transmission. A small booster fan operating off the shaft of the pulverizer forces the preheated primary air through



A Cut-Away Side View of One of the New Boiler Units, Showing the General Features of Construction

the pulverizer. The use of preheated air in the pulverizers eliminates the difficulties ordinarily encountered with wet coal in unit pulverizers.

The primary air from the pulverizer, carrying pulverized coal in suspension, is blown through the burner nozzle with a rotary motion or swirl, and the secondary air is introduced around the burner nozzle with the same rotary motion or swirl, by means of a series of adjustable vanes. The secondary air preheated from the furnace walls enters the firebox or furnace at a temperature of from 250 deg. F. to 350 deg. F., and the primary air enters the furnace with the pulverized coal at a temperature of approximately 100 deg. F.

The high degree of turbulence of the coal and air mixture and the fineness of the pulverized coal in the furnace at the point of ignition are important factors in producing nearly complete combustion. In addition, an oil burner of the steam atomizing type is located in the center of the burner nozzle. This burner serves as a lighting torch to ignite the pulverized coal when starting a cold boiler, and has sufficient capacity to operate the boiler at nominal rating in an emergency.

The new boilers have three points of combustion control; the variable-speed transmission of the screw conveyor with a feed range of 6 to 1, which forces the coal into the pulverizer; the shutter regulating the air from the forced-draft fan which forces the air used for combustion through the air spaces in the walls and floor of the furnace; and the stack damper which controls air flow through the boiler and the furnace pressure. These controls are regulated by a Hagan Corporation Combustion Control to maintain a steam pressure of 150 lb.

On an instrument panel board located in front of the boiler are the combustion control master regulator, the

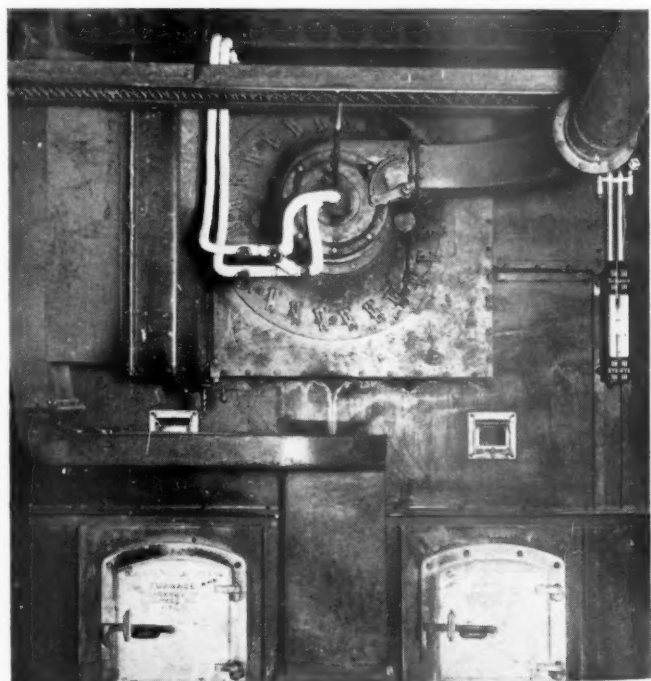
starter buttons for the pulverizer and the forced-draft fan, CO₂ meters (which indicate the flue gas analysis), steam flow meters, feed water and steam pressure indicating gages, draft and burner air pressure indicating gages, and preheated air temperature recording thermometers. A remote boiler-water-level gage is located on the front walls beside the burners. Automatic, Swarthout feed water regulators control water supply.

The coal used, which is of screenings or smaller lump size, is unloaded into a track hopper at the side of the building and elevated by a chain-type bucket conveyor to an 80-ton hopper above the pulverizers. From this hopper it feeds by gravity into a weigh larry before being dumped into the pulverizer hoppers.

Ash and soot from the furnace are collected in a hopper located at the rear of the mud drum, above which, in the last pass of the boiler, is an arrangement of baffles to cause the maximum deposition of fines from the flue gases. The ash and soot collected are conveyed from the hopper to an ash collector tank by a United Conveyor Company vacuum ash removal system in which steam jets are used to provide the vacuum. The ash collector tank is so located that it dumps directly by gravity into railroad cars spotted for the purpose.

This installation has now been in service for more than a year, during which time it has confirmed the preliminary studies. The average cost of steam with the old installation was 22.42 cents per 1,000 lb., while with the new boilers the cost has been reduced to 13.25 cents per 1,000 lb. This saving is said to more than justify the increased capital cost of this installation over that for oil-fired boilers of the same capacity.

The boilers were furnished by the Edge Moor Iron Works, Edge Moor, Del., and the furnace settings by the Furnace Economy Company, Chicago. The pulver-



The Front of the Furnace, Showing the Burner Nozzle and Coal and Air Ducts

izers and burners are products of the Whiting Corporation, Harvey, Ill., and the forced-draft fan was manufactured by the Clarage Fan Co., Kalamazoo, Mich. The boiler equipment installation was made under the general

(Continued on page 335)

Lehigh Valley Distinctively Styles "Asa Packer" Train



Cars and locomotive for Newark-Mauch Chunk service finished in yellow and black—
Fluorescent lighting in club-diner

ON February 1 the Lehigh Valley placed in regular service on its Newark-Mauch Chunk run a passenger train which had been completely reconditioned inside and outside, the coaches finished in special colors, and the Pacific type locomotive stream-styled in conformity with the rest of the train. The train, which was christened the Asa Packer in ceremonies at Bethlehem, Pa., on January 31, as noted in the February 4 issue of the *Railway Age*, page 239, provides a late morning service between Newark, N. J., and important stations to Mauch Chunk, Pa., with a late afternoon return trip. Close connections are made with the Pennsylvania at Newark from and to New York. The exterior styling and the interior decorations and appointments were designed by Otto Kuhler.

The train consists of a combination baggage-coach, two coaches, and a combination club-diner. Beyond redecorating and general repairs, relatively little was done to the coaches. All three are alike in interior decorations. The finish is light buff and gray—light buff on the ceilings and gray on the sides and end walls—separated by a wide orange stripe at the curtain-molding level. The continuous parcel racks are aluminum.

The original walkover seats with their figured green upholstery have been retained. A complete change in effect, however, has been produced by the application of slip covers to the backs. These covers, which extend about half way down the backs of the seats, are tan, relieved by three horizontal stripes in orange and two black diamonds, the familiar insignia of the Lehigh Valley. The facing of the Pantasote window curtains is blue with a light-tan overall figure. Aisle strips of specially woven carpet are in green, with wide black borders, to harmonize with the seat upholstery. The vestibules have been refinished in a light blue-gray.

The coaches have been fitted with new National Lock

Washer window sash of extruded aluminum and steel with double weather stripping of felt on the sides and of rubber at the bottom. This weather stripping effectively excludes fine cinders and much dust from the car. New friction draft gears were applied to all of the cars in the train.

No changes were made in the lighting or ventilation of the coaches.

The Club-Dining Car

The outstanding feature of the train is the air-conditioned club-dining car. The dining room and club sections have been completely rearranged. The decorations include a complete installation of fluorescent lighting. The total result is an unusually charming interior in which the seating capacity has been increased from 36 in the former arrangement to a total of 42 in the car as it is today.

Among the changes in the car is a separation between the club section and dining room by building in cupboards which extend to the lower deck ceiling, one on each side immediately back of the cocktail nook. The space below the cocktail nooks is also utilized for storage lockers. The original linen lockers and washrooms were removed and two full toilet rooms installed at the front end of the car. Formerly blind, this end now has a vestibule with steps on each side. Additional locker space has been built in back of the toilets.

The combination of ivory, rust, and silver gray in the interior decorations and finish of the club section, with the soft and highly diffused light from the fluorescent lamps, produce an unusual atmosphere of hospitality and comfort. The ceilings are a light tone of ivory. The sides and end walls are finished in two tones of gray—a light shade between the windows and a darker shade below. Above the window sills the walls, however, are



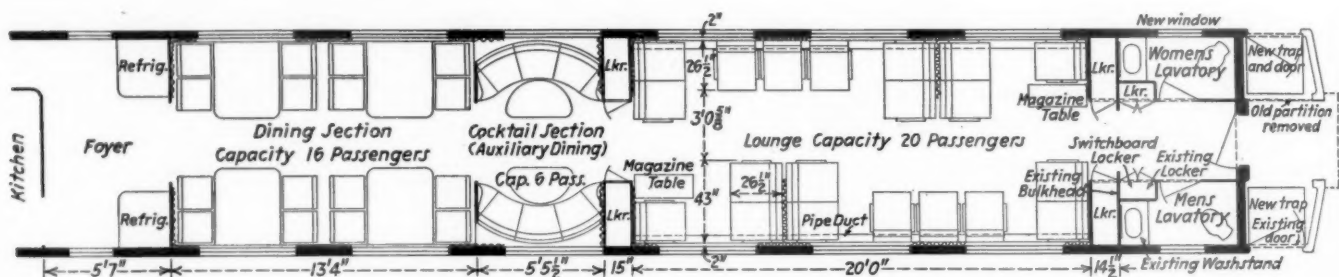
Fluorescent Lights Are Placed Vertically in the Sides of the Car Above the Windows

the cars are in aluminum, outlined in black, on the yellow panel below the windows.

A distinctive appearance has been produced on the locomotive with a minimum of change in structure. The space between the bottom of the smokebox and the front bumper has been enclosed and the front decorated with the diamond emblem of the railroad and the name of the train. Extending above the side of the running board is a stream-styled panel in yellow, outlined with black. The sides of the tender are finished to conform with the lines of the sides of the cars.

Lighting and Air Conditioning

The power-supply system on the club-diner includes a 20-kw., 32-volt Safety Car Heating & Lighting Company generator and control, a D-R V-belt gear drive, and an Exide 1,000-amp.-hr. storage battery. The air-conditioning system, supplied by the General Electric Company, employs two evaporators, one in each end of the car. The recirculated air is drawn into the evaporators through a ceiling opening at each end of the car



Floor Plan of the Club-Diner for the Lehigh Valley "Asa Packer"

completely covered with printed drapes of rust with tan and blue decorations. Additional separation is attained in the club section by a similar drape which hangs transversely between the backs of two settees on each side of the car and contribute to the intimate and hospitable atmosphere. As the drapes are staggered, they do not destroy the unity of the club section as a whole. An outline reproduction of the original Consolidation type locomotive of the Lehigh Valley in the horizontal stripes adds a touch of historical interest to the drapes. The Pantasote window shades are silk faced in a light rust tan. The window sills are black enamel.

The settees and chairs in the club room have satin-finish stainless-steel tubular frames and are upholstered in silver-gray uncut mohair. Seats are provided for 20 persons. Both the club and dining rooms are carpeted in a diamond pattern of silver gray on a deep rust field.

In the dining room there are four tables, each with seats for four persons. These tables have rubber-tile tops with inlaid pattern borders. The dining chair have aluminum frames and are upholstered in buff. Adjoining the club section are two cocktail nooks, one on each side, which seat three persons each behind small oval-top tables. These seats are upholstered in buff leather similar to that on the dining chairs.

The Exterior Treatment

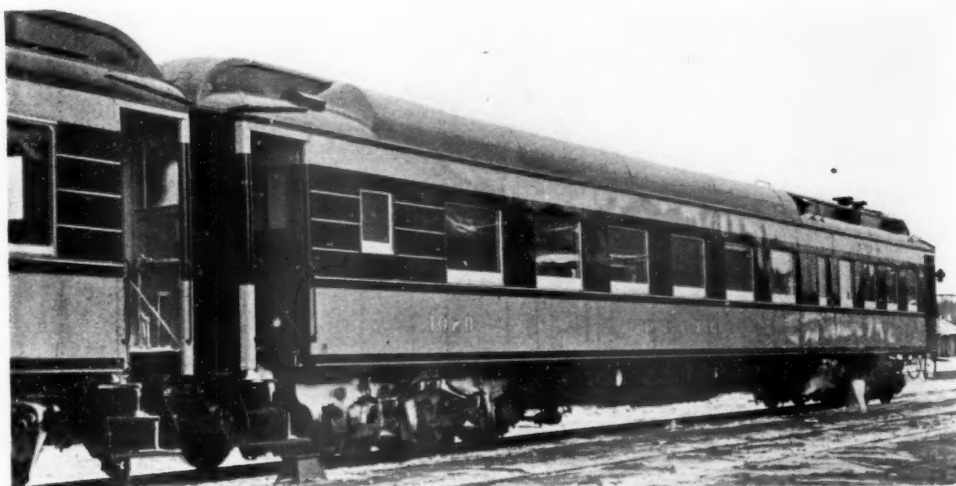
The exterior is strikingly finished in yellow and black. The window panels are black on a yellow field, which includes the letterboard and the side of the car below the windows. The latter is decorated with wide black stripes in the yellow near the top and bottom of the panel. The name of the railroad and the numbers of

and delivered through overhead ducts with louver openings spaced evenly along either side of the clerestory. A partition midway in the ducts separates the two cir-



Dominant Notes in the Club-Diner Interior Are the Figured Drapes and the Fluorescent Lighting—The Photograph Was Taken by the Car Lighting Alone

The Simple Styling of the Locomotive Repeats the Colors on the Cars—A Minimum of Structural Change Was Involved



The Coaches Are Finished in Yellow and Black—The Rear Car Is the Club-Diner

culating systems. The air-conditioning control system is the General Electric differential type, which causes the temperature in the car to vary as a function of the outdoor temperature. The compressor has a capacity of seven tons.

General lighting in the car is supplied entirely by 18-in. white fluorescent tubes. They are mounted vertically in groups of six over each window. A semi-cylindrical shield over each lighting unit protects the passenger's eyes from the direct light of the lamp, while curved, ivory-colored reflectors back of the lamps cause them to give a diffused glow of light throughout the car. A sparkling effect is obtained by small diamond perforations near the center of each shield, through which may be seen a little of the lighting unit itself. There are 12 groups of six lamps in the body of the car, and there are also eight horizontally mounted fluorescent units. These include one in each toilet, one in the aisle between, two over the buffet and three in the aisle alongside the kitchen and pantry.

The fluorescent lamps are controlled by six switches—three circuits supply 16 lamps each, two circuits supply 12, and one supplies 8 lamps. The circuits are so arranged that a circuit failure will not darken any one section of the car, but will only take out scattered lighting units. The fluorescent lighting units are supplemented by five 25- and two 50-watt incandescent fixtures in the kitchen, three 25- and one 50-watt units in the pantry, and four 25-watt units in the vestibules. Each of the fluorescent units is rated 15 watts and, with its activator, requires 17 watts input. The total connected lighting load, therefore, consists of 1,360 watts in fluorescent units

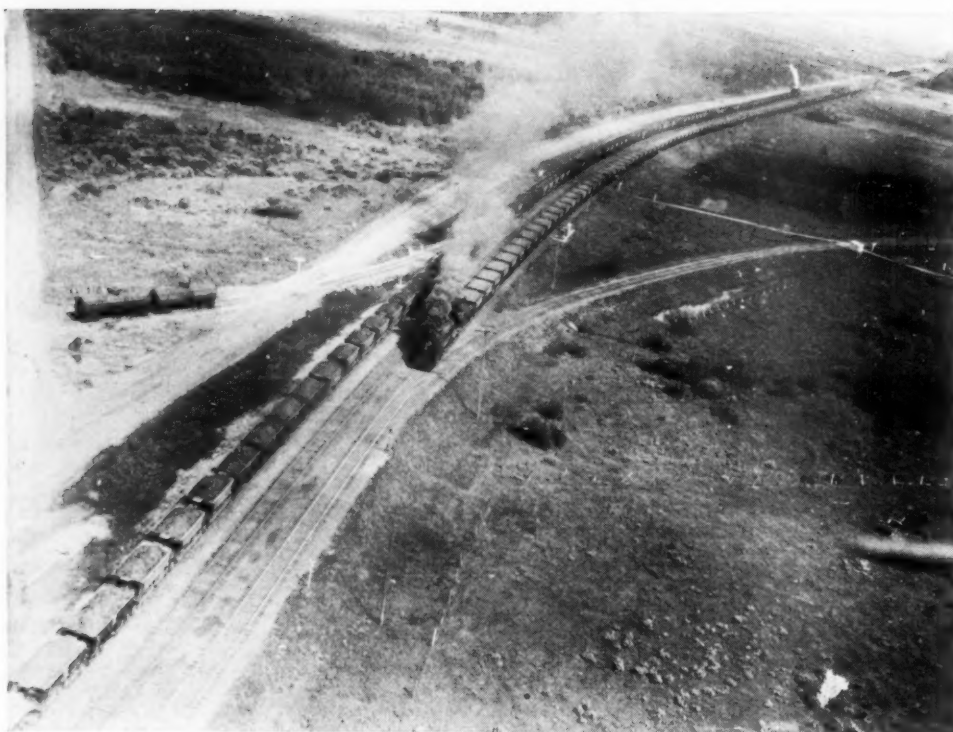
and 450 watts of incandescent lamps, a total of 1,810 watts. The central portion of the car is lighted by 72 fluorescent lamps, and the lighting intensity on the reading plane is about four footcandles.

The 32-volt, direct-current power, supplied by the axle system, is changed to the necessary 110-volt, 60-cycle, a.c. power by means of six General Electric vibrating type inverters. One-hundred-ten volts are not sufficient to strike the arc across the tube of a fluorescent lamp, and this is accomplished by an auxiliary device which momentarily raises the voltage across the lamp. The starting device used for the club-diner is of a special type which is instantaneous in action. After the arc is started the auxiliary device also serves to limit the current through the arc.

New Boilers Effect Economies on the Missouri Pacific

(Continued from page 332)

direction of O. A. Garber, chief mechanical officer of the Missouri Pacific, and the construction details, including building changes and the construction of the coal and ash handling equipment, were handled under the general supervision of F. E. Bates, chief engineer, who at that time was bridge engineer of the railroad. The work was carried out under the direction of John E. Kilker, shop engineer, and J. C. McElree, electrical engineer.



Even "Drag" Freight Trains
Require Fast Schedules in
Modern Transportation

Operating Fast Freight Trains*

Problems involved in supplying the present day
demands for prompt service

THE placing of complete and accurate consists in the hands of the general yardmaster as far in advance of the trains' arrival as possible, is one of the most important measures in expediting the movement of trains through terminals, and one that still affords much opportunity for improvement on many railroads. In many cases, time no longer permits waiting for yard clerks to make switch lists from incoming bills. Various methods are employed to do this work, but where there is delay, the use of teletype machines and other means can overcome this difficulty.

With a proper consist the general yardmaster is able to program the work so that no lost motion will develop when the train arrives. He can have yard engines, car inspectors, ice-house men, stock feeders, etc., thoroughly instructed and prepared to handle their tasks. This is particularly important in intermediate classification yards where consolidations of two or more trains are made. Better switching results can usually be obtained by handling comparatively short cuts of cars, and where it can be done advantageously two or more yard engines usually facilitate the handling of important manifest trains. Some railroads, where working contracts permit, have found it desirable to use car inspectors, laborers, etc., to assist yard crews in the bleeding of air, while others have switching crews consisting of the engine crew and five ground men. The two additional

men assist in bleeding air, throwing switches, making cuts, etc. The benefit to be derived from this expedient depends entirely upon the terminal layout and whether the situation will justify the increased expense. In large industrial centers the work must be scheduled to render proper service, and much can be accomplished by operating switching crews on regular schedules to various parts of the terminal, and to and from connections where traffic is heavy. Industrial, freighthouse, perishable terminal and connection switching should be performed at fixed periods daily to produce service satisfactory to patrons.

Road train crews that are to pick up and set off cars in intermediate terminals should be given advance notice as to where the work is to be performed, and when track arrangements permit, yard engines can often profitably assist in expediting the work. A new development that justifies close attention is the two-way voice communication between the yard office and locomotives, installed by the Birmingham Southern to facilitate co-ordination and close supervision of the terminal work at Birmingham. Inspection delays can be reduced by completing portions of a train and permitting the yard engines to handle such portions while the balance of the train is being inspected. Proper blue-flag protection should be afforded inspectors at all times. When facilities are so constructed that engines can work at both ends of a train, a great deal of time can be saved. When service demands require it, inspection forces should be increased to reduce this delay further.

Any study of freight train operation brings into the

* From a report presented before the convention of the American Association of Railroad Superintendents by a committee of which P. M. Shoemaker, superintendent freight transportation, New York, New Haven & Hartford, was chairman.

limelight the time consumed at originating, intermediate, and terminating yards, in relation to road time. A breakdown of this detention apportions a substantial part of it to car inspection and brake testing. It is interesting to observe the variations in practice on different roads. It is understandable that some roads have varying rigidity of car inspection consistent with varying operating conditions; yet it is not understandable that air brake inspection and testing—primarily safety matters—should result in greater delay on one road than on another and suitable agencies concerned should study this matter with a view to modernizing practices if that seems desirable.

Road Operation

The time seems to be approaching when single track operation by train orders on reasonably heavy traffic lines will be recognized as antiquated. Remarkable improvement has been made in road train performance by closely policing the numerous conditions that cause delay, but there is a natural limit to this procedure which can only be overcome by such improvements as centralized traffic control and operation by signal indication without the use of train orders. The speed requirements of today will force the consideration of centralized traffic control in territories where the density of traffic justifies the expenditure, and provide for operation by signal indication in other territories by placing signals and switches under the control of operators.

If the application of rule 93 is extended over too much territory, it greatly retards train movement in congested terminals. This can be improved if terminal limits are established to take in all of the territory handled by yard engines, and yard limits marked off within these terminal limits to cover the congested area only, and requiring compliance with rule No. 93 within these shortened yard limits. Some carriers have yard limits extending 20 miles, with resulting limitation of fast road movement. For roads operating fast freight trains as first or second class trains, relief is possible by adding a provision to rule 93 permitting the use of main tracks, clearing both first and second class trains in cases where this is not now provided.

One important freight carrier has made marked improvement in road performance in fast freight service by utilizing a dynamometer car—and in some cases merely a caboose equipped to permit stop-watch observations of detailed train handling—to develop various features of locomotive performance, and varying personnel performance in relation to train handling. Such observations have been found helpful in improving lagging train performance, meeting resistance to combining time with tonnage rating, and building a more dependable record of train operation. Used constructively, such information has been found effective in building up an increased feeling of pride among individual enginemen in their technique of operation, but if used as a basis for general criticism, such information may react detrimentally to all concerned. Another carrier feels that it is insuring a more dependable road performance by setting locomotives back to slow freight service after a mileage of 100,000 is attained and possibilities of breakdown are therefore relatively greater.

A delay in connection with billing may be sufficient to offset advantages afforded by special equipment or facilities that represent investments of thousands of dollars. Each railroad has its own particular billing problems. Any method that does not permit the delivery of bills to the conductor at departure time requires improvement.

When waybills are received at terminals and junction

points in advance of trains, time can be saved and shipments expedited. The success of the card waybill method depends on the arrival of the regular billing at the destination or junction point ahead of, or simultaneously with, the car; otherwise, any gain at the point of origin is offset by the loss of time at other points.

When a freight train is not overtaken or passed by another train, it may be necessary to resort to such services as U. S. mail, railway express, air mail, air express, telegraph, telephone or teletype to permit moving cars on card waybills from originating points, or places where records must be made from waybills. There are cases where U. S. mail or railway express over other railroads can be used to forward bills to terminals ahead of cars that have been moved on slip bills. Air mail and air express have become dependable for forwarding waybills. One railroad has found that billing can be done faster, and incidentally more economically, by telephone, utilizing normally idle night circuits. In such cases, copies can be mailed back to points of origin. Where delays in movements result from making records from waybills, serious consideration should be given to combining and consolidating reports. Accounting and traffic men can co-operate frequently in reducing passing report records.

Shop Cars and Diversions

From the moment that schedules have been determined, the best efforts of mechanical, maintenance, signal, station, yard and road forces are required to insure dependability of both carload and l. c. l. advertised services. It is of special importance that all concerned be entirely familiar with the service that is advertised, and know definitely the service obligations of each train operated. Then there must be some set-up for checking to know that advertised service is provided consistently. Cut-out cars must be given special attention. Rearrangement of "cripple track" facilities at some terminals may be found necessary to reduce the time involved in movement to and from the cripple track and for repairs, so that cars may be repaired and proceed in the train in which they arrived. Prompt and accurate handling of diversions is necessary to insure dependability in carrying out shippers' or receivers' wishes. A study of methods now in effect for the transmission and execution of diversions may develop possibilities for reducing the time involved and thus insure maximum accomplishment of diversion and re-consignment requests.

Spring switches have been installed at the ends of sidings, ends of double track, junctions, ends of yard leads, on wyes, in crossovers, in interlockings, in remote control interlockings and in C. T. C. territory to meet a variety of local operating conditions. Many of these switches are on double track where facing movements are seldom made. They are generally protected with signals to govern movements over the switch and to provide for safety of the higher speed movements.

The time saved per train stop eliminated at a spring switch location will vary with the type of train, the train load, the grade at the point involved, the size of turnout, and other local conditions. A study of 164 installations showed an average time saving of 7 minutes per train, while a time saving of 10 to 15 or more minutes may occur under less favorable operating conditions.

The operation of fast freight trains at average speeds of 40 m. p. h. and over for distances of 500 miles and more demands not only improved motive power and car equipment but also modern track and signal equipment. Modern interlockings and block signaling for directing trains by signal indication, with facilities for keeping the

slower traffic out of the way of the high speed freights, expedite fast freight traffic and assist in maintaining "on time" performance. In recent years, owing to improvements in the control and operation of signaling devices, there has been an increasing number of interlocking consolidations in order to centralize the direction of train movements and reduce operating expenses. Two, three and four former interlockings have been consolidated into one interlocking layout, with increased facility and economy of operation.

Automatically-controlled signals and other signaling devices for the protection of train movements over railway grade crossings and at other relatively simple layouts have come into considerable prominence. In the spring of 1938 there were 316 grade crossings and 25 gauntlets equipped in 42 states. These installations operate upon the approach of a train and have been called automatic interlockings, because they control signal devices which would otherwise require a manually operated interlocking plant. They were brought about by the necessity for providing an economic means of eliminating statutory stops for non-interlocked railway grade crossings where either or both of the crossing lines operated only a few trains per day. The present practice is to install these plants even when there is a traffic of 20 to 50 trains per day, or where part-time manual control is desirable on account of local operating conditions.

Remote control interlocking is used to advantage where switches are located some distance from a station, at an end of double track, a junction, a railroad crossing at grade, or at the entrance to a yard, where an operator can control the positions of the switches and signals in such a way as to allow trains to proceed without stopping or reducing speed below that specified in the rules. The time saved per train stop eliminated at an outlying switch location will vary with the train load, the grade and other local conditions. In 39 studies the time saved per freight train stop eliminated averaged about 21 minutes while the time saved per passenger train stop eliminated varied from two to five minutes.

Five installations of route interlocking are now being made. In conventional interlocking it has been the practice to operate each switch or crossover separately by moving corresponding levers, and then after the switches had moved, to clear the signal by operating its lever. In the route interlocking system, the operator can direct trains through the plant by pushing buttons or turning knobs on the diagram, one at the entering point and another at the leaving point. All of the switches in the selected route then automatically assume the correct position for that route and the signal then clears, provided the route is not obstructed and that no conflicting route is already established. If the track layout provides more than one route between two points, the preferred route will normally be selected and set up. If the preferred route is not available for any reason, the secondary route will be set up automatically. Appropriate light indicators provide the necessary information for the operator regarding the positions of switches, the clearing and automatic restoration of signals and the occupancy of track circuits by trains.

Centralized Traffic Control

Centralized traffic control eliminates the issuing of train orders and reduces the mechanics of this operation to the movement of a small lever without the co-operative action of other employees. Since C. T. C. was first installed in 1927, there have been 190 installations on about 2,000 miles of track controlling more than 1,300 power-operated switches, 3,300 signals, and 260 sidings. C. T. C. has

been applied in congested locations for eliminating "bottle-necks" on single and multiple track sections, in terminal territory with many junction points, for replacing staff systems, and for either-direction signaling on multiple track. The freight train time saved on 19 installations on 17 railroads by train operation by signal indication averaged 1.38 minutes per freight train mile. In eight cases, additional tonnage and increased g. t. m. per freight train hour resulted from the improved operation.

Higher Speeds

Longer turnouts, No. 15 and No. 20 have been used in place of the No. 10 and No. 14 turnouts formerly in use to reduce delays to trains entering and leaving sidings, or at junctions and ends of double track. The increased speed permitted through the longer turnouts is advantageous where it is desirable to save every second possible by the improved track and signal arrangement. Formerly, the use of short turnouts and stops for the hand operation of siding switches resulted in freight trains moving at low speed but with present fast freight schedules it is necessary not only to keep the main line clear for the faster traffic but also to permit the slower trains to enter and leave the sidings, junctions and ends of double track with a minimum of delay.

If existing sidings are too short or not properly located for efficient train operation, they should be increased in length or properly located. In many cases the sidings have been increased in length, depending on local conditions, with desirable results. The longer sidings facilitate non-stop meets, permit increased speed on the sidings, reduce delays and provide longer main line block spacing for the higher speed train movements.

Questionnaire

The committee sent a questionnaire to the chief operating officers of 62 of the more important roads. Detailed replies were received from 53 of those addressed, and the following conclusions reached:

1. Terminal operations, plus movements in road territory adjacent to terminals, offer the greatest field for saving time on fast freight trains.

2. Searching analysis must be given to supervisory methods and habits if the tendency toward decreasing productivity per man hour and engine hour is to be faced successfully.

3. In many cases train dispatchers can be given added responsibility for supervising details of train and co-ordinated truck operations as well as directing movements.

4. Car inspection is subject to further refinement from the standpoint of uniformity of practice and inspecting, for operating trains greater distances between inspections.

5. Lap sidings, operation by signal indications, extensive use of spring switches, modern interlocking and C. T. C. installations, each in its own sphere, offer improved freight train operation where capital expenditures for major facility improvements are justified.

6. Most railroads can analyze their billing routine to advantage from the standpoint of over-all saving in time.

7. Problems incident to meeting highway competition will continue to raise authorized maximum freight train speeds; it is felt that the elimination of arch bar trucks will be an important factor in lessening equipment restrictions and raising authorized speeds.

8. Superintendents have much to gain by territorial breakdowns of train operation costs so that the most

(Continued on page 342)

Spring Switches and Signaling on the Southern

On one 84-mile single-track line including 33 spring switches with signals, an average of 8 min. and 124.4 lb. of coal are saved each time a train stop is eliminated when a train is pulling out of a siding

DURING recent years, the Southern Railway has been installing oil-buffer type spring-switch mechanisms at numerous locations, 245 installations being made in 1937, until a total of 520 switches are now so equipped on the entire system. Of this total, 86 are located at switches at the ends of passing tracks on double track, 391 at ends of passing sidings on single track, 32 at ends of double track, 8 at junction switches, and 3 at yard lead switches.

The spring-switch mechanisms are used, of course, to eliminate the necessity for stopping trains to permit trainmen to operate hand-throw switch stands when a train is making a move out of a yard lead or siding, or from double track to single track. Even casual observation of a train making such a move gives some general idea of the train time and fuel saved, as well as the reduction in wear and tear of equipment. However, in order to determine an average saving which could be used as a basis for ascertaining whether existing installations were being used effectively, as well as to justify future spring switch installations, it was decided that a study should be made of a typical territory in which the majority of the switches were equipped with spring mechanisms. For this purpose, the 84-mile single-track line between Roe Junction at Morristown, Tenn., and Asheville, N. C., known as the French Broad River line, was chosen.

Physical Characteristics of Line

Between Roe Junction and Leadvale, 8.4 mi., this line crosses a rolling plateau with a ruling grade westbound of 1.4 per cent. Between Leadvale and Newport, 9.8 mi., the line follows up the valley of the French Broad river, with an average ascending grade of 0.25 per cent. Between Newport and Bridgeport, 4.5 mi., the line passes over a ridge with maximum grades of 1.15 per cent. From Bridgeport to Asheville, 61 mi., the line again fol-



Westbound Train Passing an Automatic Signal and Approaching a Facing-Point Spring Switch

lows the river with a gradual ascending grade varying between 0.2 to 0.5 per cent, the maximum for short distances being 0.7 per cent.

The entire territory between Leadvale and Asheville is mountainous, with the river in a comparatively narrow gorge for extended distances, necessitating that the track be located adjacent to the banks of the stream and along high rock cliffs or mountains. About 54 per cent of the line is curved ranging from 2 deg. to 10 deg., with one 14-deg. 20-min. curve 372 ft. long.

Siding Layouts

Because of the mountainous character of the country, sidings could not be spaced exactly on a distance or time-interval basis. Lap sidings are located at 11 stations, double sidings at 2 stations, and single sidings at 4 stations, Roe Junction, Witt, Leadvale and Barnard. At Alexander and Bridgeport, the switches and signals at the lap are handled by interlockings. At the remaining 9 lap layouts, the switches at the laps are equipped with hand-throw stands. The ordinary procedure, when a train is to take siding, is for the train to stop while a trainman operates the switch. In each instance, the switch at the outer end of each lap siding is equipped with a spring mechanism so that a train can pull out without stopping. At Hot Springs and Sandy Bottom, the sidings are not lapped, but the operation of the

switches is as explained above. At Barnard, both ends of the single sidings are equipped with spring switches. At Roe Junction and Leadvale, the switch at the entering end of a siding is included in an interlocking, while a spring switch is used at the leaving end. Considering the Roe Junction-Asheville territory as a whole, buffer spring mechanisms are in service at 32 ends of passing sidings and at the end-of-double-track at Craggy, 4.9 miles from Asheville.

Number of Trains and Type of Traffic

On a typical day, 6 passenger and 17 freight trains are operated between Roe Junction and Leadvale, and 6 passenger and 30 freight trains between Leadvale and Asheville. Helper service between Newport and Bridgeport requires about 8 additional movements. During peak periods, as many as 42 trains have been handled as a daily average for several months.

The eastbound through traffic consists of coal, merchandise and manufactured products such as automobiles. Westbound through traffic includes tobacco products, furniture and textiles. The number of cars of this high-class traffic is about the same in each direction. All of this traffic is handled in manifest scheduled trains, about five manifest trains being operated each way daily. Some coal from Kentucky and Tennessee is routed east through Knoxville to Asheville via the French Broad River line. A much larger volume of coal, from southwestern Virginia, moves south over a branch line of the Southern and comes onto the French Broad River line at Leadvale. This coal then moves east through Asheville to various cities in the southeast, as well as to ports for export. The majority of this coal is handled in through trains operated from Bulls Gap, Tenn., through Leadvale to Asheville, but part of it is set out at Leadvale and used to fill out other eastbound trains. On account of the coal, the preponderance of traffic is eastbound in both loaded cars and tonnage.

Train Speeds and Schedules

The necessity for reducing train speeds on curves is one of the major factors which reduces the over-all average speed between terminals. On many of the curves,

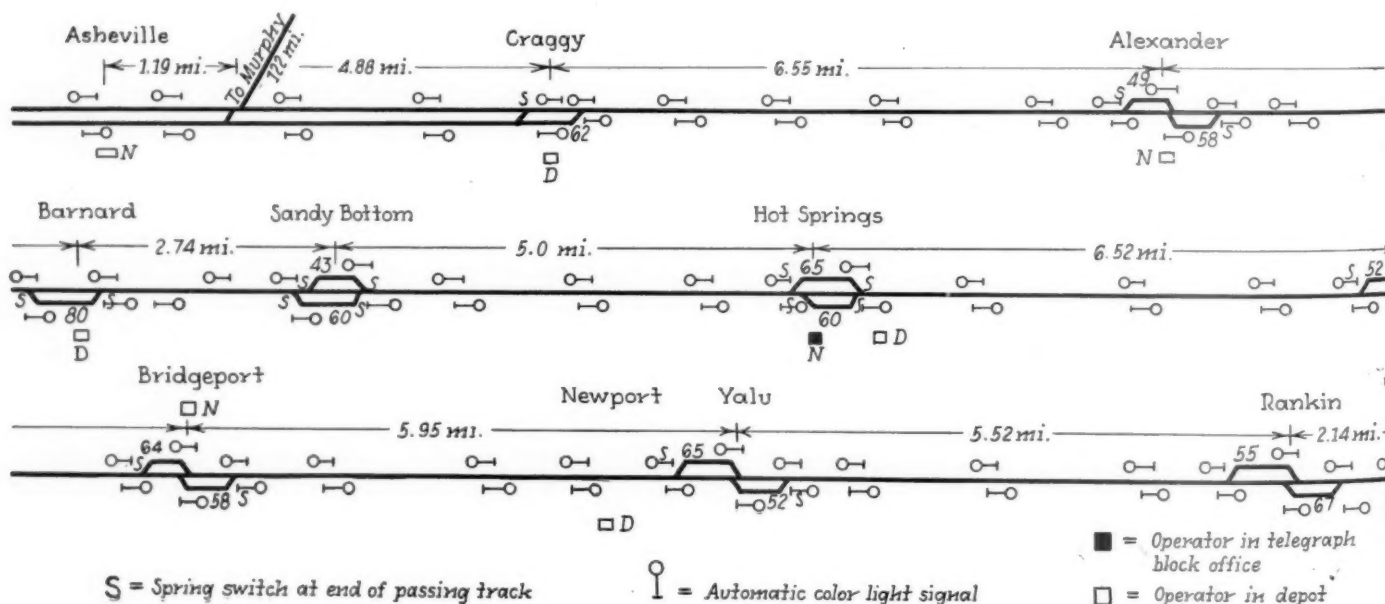
the speed limit is 35 m. p. h. for passenger and 25 m. p. h. for freight trains, while on some curves the limits are 25 m. p. h. and 15 m. p. h., respectively. As a result of these numerous speed restrictions, the actual over-all average speed of passenger trains, including 3 stops, is about 33 m. p. h. for the 84 miles between Roe Junction and Asheville. Manifest freight trains are scheduled for 4 hr. 25 min., or at an average speed of 19.3 m. p. h., while the slower freights average about 5 hr. 20 min.

Train movements are directed by time table and train orders, with absolute-permissive automatic block signal protection, color-light automatic signaling having been installed on this territory in 1925. Train-order offices are open 24 hr. daily at 7 points, as indicated by the letter N on the diagram; 5 offices, open during the day only, are designated by the letter D.

Success Due to Two Factors

The success in the operation of this line, as measured in the average over-all time of trains between terminals, is due principally to two important factors. Through years of experience, the engine and train crews have developed a technique of operating their trains between stations in exact time intervals. With this basis of road operation, and the automatic signaling for protection, the dispatcher can arrange very close meets, and by timing the extra trains to fit in with those scheduled, the trains can be spaced on time intervals which allow a smooth flow of traffic in each direction.

When 30 to 40 trains a day are being handled over a single-track line, the number of meets increases to the point that the time so consumed becomes a major factor. On February 18, which was typical for the traffic handled at the present low level, 3 passenger trains and 13 freight trains were operated westbound and 3 passenger trains and 11 freight trains eastbound. An analysis of the train sheet by the dispatcher and the trainmaster showed that in at least 71 instances, trains took siding on this date to make meets or passes. Further study by these men, as well as by other operating officers, engineers and train crews, led to the decision that, on the average, a train can move out of a passing track equipped with a spring switch mechanism 8 min. quicker than



Track and Signal Plan, Showing Spring Switches on French Broad

when making the same move where a hand-throw switch stand is in service.

In arriving at this figure of 8 min., consideration was given to the number of instances in which trains move from one siding to another against a passenger train or other superior train by schedule or train order. For instance, a westbound freight may be in the siding at Bridgeport to meet an eastbound freight, and after the eastbound train passes, it may have 20 min. to make Yalu for a passenger train. With the spring switch, the move can be made; otherwise it cannot. Thus, the spring switch has the same effect as moving the passing tracks closer together. Also at many locations on curves, an engineman, when pulling a train out of a siding, cannot see enough of his train to know when the rear end has cleared the switch. Therefore, with hand-throw switches he would have to run at slow speed for an extended period to give the trainman a chance to return the switch to normal and board the caboose. On ascending grades, this slow-speed running is a serious handicap in attaining normal speed, whereas with a spring switch mechanism in service, the train can pull out through the switch at 15 m. p. h., and, as no stop is required, attain normal running speed within a short distance. The speed limit through No. 10 turnouts is fixed at 15 m. p. h., and through No. 20 turnouts, at 20 m. p. h.

Figuring an average of 8 min. saving on each of the 69 freight train movements from sidings on February 18, a total of 552 min. or 9 hr. 12 min., train time was saved, or an average of 23 min. for each freight train. This does not, however, represent the entire time saving, because it is apparent that if each train should spend 23 min. more on the road, some of the trains would have to meet other trains which had left a terminal in that 23-min. period. On the other hand, if a train, in making a move from one siding to another, saved 8 min. by means of the spring switch, and then waited longer than 8 min. at the second siding, then part of the original 8 min. saving would be cancelled. However, a study of the time-distance graph of train operation for February 18 shows that the meets were, in most instances, on close time, and that, therefore, the 8 min. was saved.

As data concerning the over-all time between terminals of manifest trains is kept in a readily accessible form,

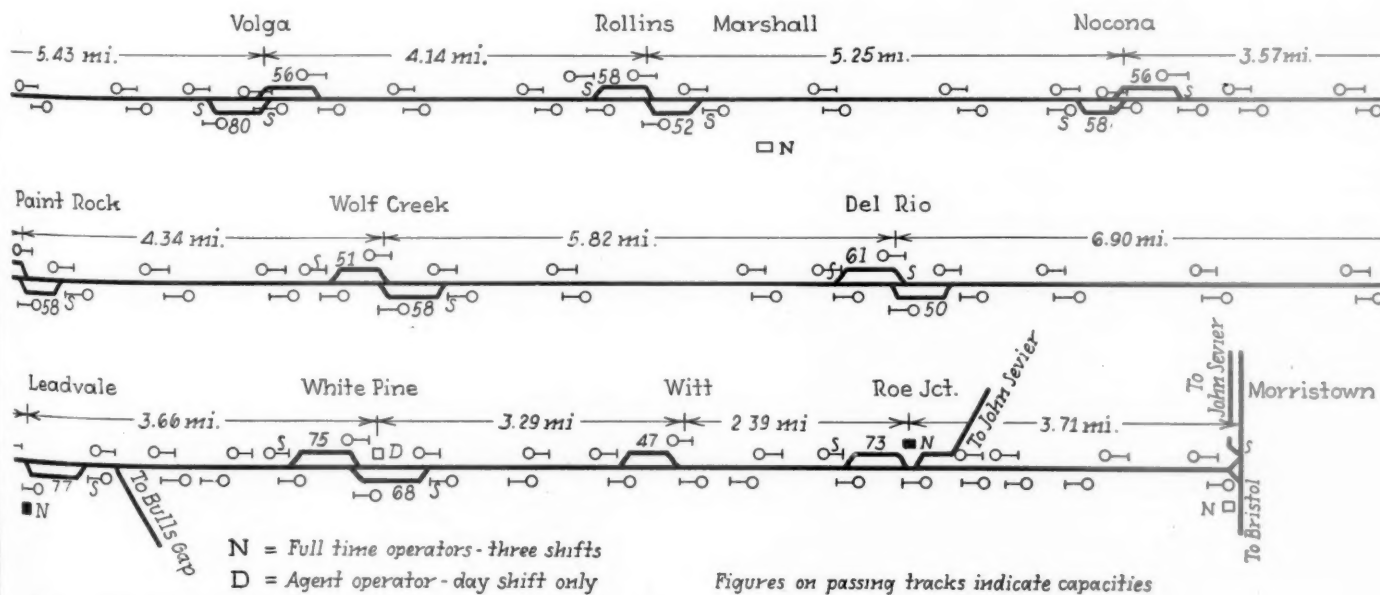
it was decided that a comparison could easily be made for these trains. In January, 1935, only 11 spring switches were in service on the Roe Junction-Asheville territory, while in January, 1938, there were 33. In January, 1935, a total of 227 manifest freight trains were operated, as compared with 243 trains in January, 1938. The total saving in road time for the 243 trains operated in January, 1938, as compared with the 227 trains operated in January, 1935, was 230 hr. 15 min., or an average of 57 min. for each of the 243 manifest trains.

Fuel and Water Saving

An extended series of calculations was made to determine the savings in fuel and water that were effected by the elimination of train stops at the locations where spring switches were in service. A table was set up showing the grades encountered by a train leaving each of the passing tracks. Figures were then calculated for the coal saved by the elimination of a train stop at each of these locations, and graphs were prepared for different classes of locomotive and tonnage handled. Coal was figured at \$2.52 per ton. Water consumption was figured at one gallon for each pound of coal, and it was priced at 3 cents per thousand gallons.

The preponderance of tonnage moves eastbound, and at the majority of sidings the grade is adverse for eastbound trains. For these reasons, eastbound trains are given preference and westbound trains take siding in the majority of instances. On the typical day, February 18, 1938, there were a total of 71 moves out of sidings where spring switches eliminated train stops. Fifteen of these moves were made by eastbound freights and 1 by an eastbound passenger train, while 54 were made by westbound freights and 1 by a westbound passenger train. The coal consumption eliminated for each of the freight train moves was calculated, the average for the eastbound freight trains being 177.8 lb., costing 22.4 cents, and the average for westbound trains 109.6 lb., costing 13.8 cents. The average for the 69 freight train movements, 15 eastbound and 54 westbound, was 124.4 lb., or a total of 4.29 tons, which at \$2.52 per ton totals \$10.81.

The water cost, calculated as explained previously, was



River Line Between Asheville, N. C., and Roe Junction, Tenn.

25.8 cents, thus giving a total fuel and water saving, for the 59 freight train stops eliminated, of \$11.07. Figuring this average for 365 days, the total annual saving for fuel and water is \$4,040.55. This amount is considered to be conservative, in consideration of the fact that the volume of traffic was low during the period including the typical day on which the calculations are based. The net charges for the installation of the 33 spring switch mechanisms, reinforced points and fittings, etc., was \$6,270. Figuring 6 per cent interest on investment, and 10 per cent for maintenance and depreciation, the annual carrying charge is about \$1,003.20. Thus, the fuel and water savings, to say nothing of the time saved, represent a return on the investment of 48.4 per cent.

Spring Switch Construction

The rail on this line is of 130-lb. and 100-lb. sections. The turnouts at the passing tracks are No. 10 and at the end-of-double-track No. 20. When installing a spring switch, the points are replaced with points having a 1¼-in. reinforcing steel strap riveted to the gage side. For points 16½ ft. in length, 4 tie bars are used, and for points of longer lengths, 5 tie bars are used. Cast-steel heel-blocks and frog and switch joints are installed. The bar at the heel end of the point is bent to the proper angle and recessed, and a pipe thimble separator is used on the bolt to allow enough tolerance to prevent binding of the heel in the joint. Heat-treated bolts are installed in the joints. Any tie plates, rail braces, or ties that are worn or defective are replaced. In order to minimize creepage, additional anchors are applied in the vicinity of the switches. In each instance, the old switch stand is replaced with a new one and bolted down, the new Century 51A low stand being used, and the Pettibone-Mulliken Company mechanical switchman type of spring switch mechanism, together with connections, forms the connecting rod between the stand and the end of the tie bar.

The location of a spring switch is shown by a marker consisting of a cast-iron disk, 11 in. in diameter, with the letters "SS" raised and painted black on a yellow background, the disk being mounted on a cast-iron post 3 ft. above ground and located on the engineman's side of the track opposite the clearance on the turnout.

Signal Protection

All installations of spring switches on the Southern Railway are protected by automatic signals controlled by the position of the switches. On the French Broad River line, General Railway Signal Company Type-D, three-aspect, color-light automatic signals are in service, a signal being located generally 150 ft. in the approach to each facing-point switch at the end of a siding. The automatic signaling is supplemented by a system of G. R. S. intermittent automatic train stop which will automatically apply the air brakes if an engineman overlooks a caution or a stop indication of a signal. When installing a spring switch, a new G. R. S. Model-7 switch circuit controller is installed to replace the one previously in service. The circuits controlling the signals are connected through contacts in these controllers and the contacts are adjusted so that if a switch point is open ¼ in., the first signal in each direction will display the red aspect and the second signal in each direction will display yellow.

Insofar as a switch is concerned, no speed restriction is in effect for train movements in either direction on the main track over a spring switch.

Operating Fast Freight Trains

(Continued from page 338)

economical combination of power and tonnage may be programmed according to territorial characteristics.

9. There is an apparent trend away from high speed "merchandise only" trains toward "general" high speed trains for all high-class freight, both carload and merchandise, and both perishable and non-perishable, this possibly being a further result of trucking encroachment upon carload business.

Discussion

Following the presentation of this report, O. R. Teague (S. A. L.) described in detail the operating economies effected in handling fast trains as the result of the installation of 12 spring switches in 106 miles between Hamlet, N. C., and Columbia, S. C. F. B. Whitman (C. B. & Q.) raised a question as to the committee's statements on air brake tests, to which P. M. Shoemaker (N. Y. N. H. & H.) replied that any comparison of terminal operations will show a substantial variation in time used for inspection and brake tests, and that, if the present practice were efficient in all cases it would not take 45 min. for such tests on one road and only 15 min. on another. He recommended that the subject be studied with a view to modernizing current practices. In response to a question from R. C. Randall (Erie), P. L. Peffer (N. Y. C. & St. L.) stated that his road has eliminated yard limits at intermediate points in many cases, and stated that at other points yard limits could be narrowed to advantage.

Messrs. Randall and Teague described the good results obtained from the use of auxiliary water tanks, and J. W. Rea (M. P.) whose road has been using such cars for years, also spoke of the benefits obtained therefrom. C. J. Foster (C. G. W.) cited large savings made by the use of such cars between St. Joseph, Mo., and Des Moines, Iowa, by closing pumping stations and eliminating train stops and stated that to avoid freezing in winter a steam pipe admits steam to the water connections between the auxiliary and primary tanks of the locomotives. S. Hammer (M. P.) stated that the use of auxiliary tanks on the Gulf Coast Lines between Baton Rouge, La., and Brownsville, Texas, had eliminated ten water stops on that run.

* * *



Photo by Canadian National

The Canadian National Put on This Show for the Dedication Ceremonies at the Opening of the New International Bridge Connecting Port Huron, Mich., With Sarnia, Ont.

Jobless Railroaders Hit "Old Heads"

Junior transportation-department employees appeal
to House committee for legislation to
halt "mileage hogging"

WASHINGTON, D. C.

FURLOUGHED train and engine service employees had a day in court at the February 16 session of House committee on interstate and foreign commerce hearings on Chairman Lea's omnibus transportation bill. Through their spokesman, Ernest A. Ledwith of Emporia, Kans., an Atchison, Topeka & Santa Fe engineer and a member of the Brotherhood of Locomotive Firemen & Enginemen, a group of dissatisfied junior employees assailed the "mileage hogging" of the old heads, and the inaction of the brotherhoods, appealing to the committee for the enactment of legislation which would limit train and engine service men to a maximum working month of 26 days or the equivalent.

Meanwhile J. Ninian Beall, general counsel of American Trucking Associations, Inc., had completed his testimony, while J. D. Shatford, chairman of the Railroad Owners Association, followed Mr. Ledwith with a brief presentation on behalf of that Association. Judge R. V. Fletcher, vice-president and general counsel of the Association of American Railroads, returned for the February 21 session to resume his presentation at the point where it was suspended on February 8. After supplying certain data which had been requested by committee members the A. A. R. general counsel addressed himself to the new rule of rate making which is to be proposed in the committee-of-six's forthcoming rewrite of the Interstate Commerce Act.

Lea Would Expedite Hearings

At the February 16 session Chairman Lea announced that hereafter witnesses would have to make their statements more brief in order that the committee might have time to complete hearings on the bill. He said that the bill would have to be placed before a subcommittee for more intensive hearings and then returned to the full committee before it could be piloted through the House. The chairman said that he disliked having to limit witnesses, but that it would be necessary if any railroad legislation were to be enacted during the present session. Representative Bulwinkle, Democrat of North Carolina, read a letter from a railroad brotherhood local in his district which criticized the committee for not speeding up railroad legislation. Mr. Bulwinkle wondered what the local was writing about in view of the fact that the committee-of-six's railroad-labor bill has not yet been introduced. Representative Patrick, Democrat of Alabama, said that he had been receiving the same kind of letters.

At the same session Mr. Beall concluded his statement and submitted several exhibits for inclusion in the record. He also submitted to the committee a proposed amendment to the Motor Carrier Act which would provide for the regulation of forwarding companies in the motor carrier industry.

Mr. Ledwith explained how his appearance came about

as a result of meeting in Emporia about February 1 where a "group of the boys" got together and decided to contact spokesmen for junior employees in other parts of the country, insofar as such spokesmen had been identified by letters appearing in the brotherhood magazines. The upshot was the arrival in Washington early last week of a delegation of 18 representing dissatisfied junior employees "from all parts of the United States." Mr. Ledwith was chosen to make the presentation before the committee.

Referring first to discussions of proposed amendments to the Railroad Retirement Act, the witness expressed the view that the "real reason" why that act "has not been effectual" is to be found in "high mileage maximums permitted under present working contracts" which "allow exorbitant earnings to be made," with the result that only a few of the eligible employees have taken advantage of "the liberalities of this wonderful and humane law." Later Mr. Ledwith told Representative Halleck, Republican of Indiana, that he would favor compulsory retirement at 65; and he would be willing to pay such additional pension taxes as would be necessary to finance such a set-up.

Brotherhood Chiefs "Sit Idly By"

The senior men, the witness went on, "hold the best jobs, and, aided by modern easy-riding equipment and high-speed schedules . . . insist that they have a right to stay on the job until the undertaker calls for them." He called the group he represented "good, honest, law-abiding, American citizens seeking some measure of relief from an intolerable condition," their "sole aim and purpose" being to "effect the re-employment of thousands of furloughed engine and train service employees." The "real tragedy" of the situation, Mr. Ledwith added, "is that the five great brotherhoods of the transportation employees have made reductions possible through the by-laws of their respective organizations by empowering the general grievance committee to make mileage or day regulations. But these general grievance committees, being composed of the senior men, have failed to make any reduction in miles or days, and the heads of these organizations sit idly by and permit the senior men to ever push the junior men out of employment and onto relief rolls, thereby penalizing other citizens that they may satisfy their greed . . . thousands of railroad transportation employees are needlessly furloughed so that the senior transportation employee can earn . . . as much as was earned at the peak of the nation's prosperity.

"The senior employee, feeling himself exalted, claims the divine right by virtue of seniority to cast out his fellow workman, and demand that the merchant, the farmer and all others be taxed to provide relief for this fellow workman so that he, the senior employee, who has

never known the pangs of depression, may continue to sit in the lap of luxury. The transportation employees of the United States have been graciously and liberally rewarded by dear old Uncle Sam, and yet their gratitude is shown by the most selfish and hard-hearted methods, the exercises of unbridled seniority. Their attitude is very blunt—they decree the junior man has no right to honest labor until their gluttonous desires that have taken on the form of insanity are appeased. All forms of business, including the railroads these senior men work for, have taken shocking set-backs, but the senior transportation employee will not make one helpful move until a national law with severe penalties attached is enacted."

Next Mr. Ledwith cited the wages and hours law from which railroad transportation employees are exempt, contrasting its 44-hr. maximum week requirement with the "38 to 60 days per month" that the old heads in train and engine service are working. Also, he pointed out that a law limiting transportation employees to 26 working days or the equivalent each month "would not cost the railroads one additional cent, but would aid their business by a demand for more necessities of life that these re-employed men would use because of the more equal distribution of the gross payrolls of the railroads." Mr. Ledwith concluded by reviewing the plight of a few junior employees with whom he is acquainted, meanwhile claiming that men "way past 70" are running out of Kansas City; the modern locomotives which "ride like Pullmans" permit them to do it. All appeals to the brotherhoods "to have the hogs cut down" have been futile, he said, although a 26-day-month-maximum would distribute in Emporia alone \$130,000 a year to furloughed men.

No Hope of Relief from Brotherhood Action

The witness estimated for Representative Martin, Democrat of Colorado, that a 26-day-maximum month would put one-third of the furloughed transportation employees back to work. He did not think that compulsory retirement at 65 would do as much. Mr. Martin next pointed out that the committee was in a "difficult" position when confronted with intra-union differences, and he thought it might be necessary to have the brotherhoods act to provide the desired relief. Mr. Ledwith replied that if there were any apparent hope of relief from the brotherhoods he would not be before the committee—an appearance made possible by the "nickel and dime contributions" of furloughed men.

Chairman Shattford of the Railroad Owners Association was unable to complete the presentation which he had planned, but he submitted all of his material for the record. He offered the committee his Association's suggestions for a national transportation policy with special reference to a plan for the rehabilitation of the railroads. The plan, which has previously been made public, calls, among other things, for a secretary of transportation in the cabinet; curtailment of I. C. C. powers "to the extent that they enter the realm of management;" authority for railroads to make "agreed rates;" repeal of the long-and-short-haul clause and of land grant rates; reductions in wages; the elimination of transport subsidies and authority for railroads to own and operate all forms of transportation; amendments to the bankruptcy and the railway labor acts and repeal of the inland waterways corporation act. Also, more freedom in connection with abandonments; a railroad subsidy or guarantee of interest as a national defense measure; and consolidations of a kind which will create trans-continental systems.

Before Judge Fletcher got started on his resumed testimony, Representative Bulwinkle again asked why the committee had not been furnished with copies of former Co-ordinator Eastman's study of transport subsidies, which the North Carolinian understood had been in the hands of the railroads and other interested parties. Chairman Lea said it was his understanding that the study is not quite complete, and Judge Fletcher explained the railroads had not had a copy of the study, but had been requested to comment on "certain tentative conclusions." Mr. Bulwinkle asked if the Eastman study would not be a "rather valuable report" for the committee to have. Judge Fletcher supposed he "should say so," although he anticipates that he "won't agree with some of the conclusions."

Coming to his discussion of the rule of rate making the A. A. R. general counsel again cited the language in the present act which calls upon the Interstate Commerce Commission, in deciding rate cases, to consider "the effect of rates on the movement of traffic." He quoted excerpts from I. C. C. decisions which relied upon that language to support the commission's undertakings to say what would be best for the railroads rather than what's best for the country. He insisted that the commission has not qualifications to determine such matters, and that it is contrary to our general theory of regulation to attempt to place such power in the I. C. C. The witness agreed with Chairman Lea that the commission's minimum-rate powers present a different question because of the element of relationships between transport agencies.

Proposed Rule of Rate Making

Next Judge Fletcher was diverted by various committee members into a discussion of inter-territorial rate relationships, which discussion ended when Chairman Lea announced that the committee would have a field day on that question next Tuesday. The chairman's reference was to the committee's plan to receive presentations on February 28 with respect to various bills proposing adjustments in the territorial rate structure. The A. A. R. general counsel then got back to his rule of rate-making, and inserted the committee-of-six proposal into the record. It reads as follows:

Section 30. It shall be the duty of the Commission to exercise its authority over rates in such way as to permit the establishment by each mode of transportation of rates which, as a whole, will be adequate under honest, efficient and economical management: (a) to sustain a national transportation system sufficient at all times to meet the needs of commerce, of the Postal Service and of the national defense; (b) to establish and maintain credit so that capital essential to provide the needed facilities and service may be attracted to the transportation industry; and (c) to afford fair treatment to those having their money invested in the property held for and used in the service of transportation: Provided, That the commission shall have reasonable latitude to modify or adjust any particular rate which it may find to be unreasonable or unjustly discriminatory and to prescribe different rates for different sections of the country.

Judge Fletcher pointed out that the foregoing would not be a ratemaking rule for railroads alone—it would cover all forms of transportation. He further described it as an effort to say to the I. C. C. that it should take a broad view of the whole transport picture. The framers of the proposed rule, he went on, tried to lay emphasis on two things—the necessity for maintaining the credit of transport agencies, and the need for giving some consideration to those who have invested their money in such agencies. The A. A. R. general counsel added that the proposed rule does not ask that rates be fixed on the

basis of a fair return; but the framers do hope to create in the I. C. C. an atmosphere sympathetic with the desires of the railroads to maintain their credit.

Concluding his discussion of the proposed rule of rate-making at the February 22 session, Judge Fletcher pointed out that the National Transportation Conference, sponsored by the Chamber of Commerce of the United States, did not endorse the committee-of-six proposal—in fact it declined to go on record with respect to the rate-making-rule question. The witness went on, however, to point out that the Conference did adopt a resolution calling for new language in the Interstate Commerce Act which would make it the duty of the I. C. C. to give consideration to the needs of the carriers “for revenues sufficient to assure that their credit position will be strengthened to the point where the return upon the capital invested . . . will be sufficient to attract continually the private capital needed for the maintenance and development of such systems . . .”

Addressing himself to the suggestion that the rule of rate making should be eliminated from the Act on the theory that sections 1, 2 and 3 would take care of all situations, Judge Fletcher said that his conception of the theory of regulation requires that Congress should lay down some standard as to what the commission's general objective should be. Here committee members launched another discussion of inter-territorial rate relationships, and Judge Fletcher referred their questions to Chairman J. G. Kerr of the Southern Freight Association, who occupied the floor during most of the remainder of the session.

Southern Shippers Oppose Legislative Rate-Making

Mr. Kerr told Representative Mapes, Republican of Michigan, that he had been unable to find a “real Southern shipper” who is in favor of any of the “rate-making bills” now before Congress; he thinks that in the judgment of “real shippers” in the South the enactment of such legislation “would put us in a strait-jacket.” Previously Mr. Kerr had explained for Representative Halleck the issues in the Southern Governors' rate case where rates out of the South on some 14 commodities are assailed; and he went on to tell Representative Patrick, Democrat of Alabama, that Southern railroads are in sympathy with the general idea of obtaining for products of the South the “destination level” of rates where such is necessary in order to meet competition.

Mr. Kerr warned, however, that general “equalization” would require increases in a “great many” rates in the South.

On the whole, Mr. Kerr thinks that the present adjustment in the South meets conditions found in that territory, and he insisted that on traffic as a whole the rates between Southern points on the one hand and Northern and Eastern points on the other hand are lower than rates in the reverse direction. In the latter connection Representative Boren, Democrat of Oklahoma, said that he hopes to see written into the law a prohibition against charging different rates for the movement of the same commodity in different directions between the same points. The Oklahoman went on to say that he understood that he should be “subdued” when it came to a discussion of freight rates—a subject which “an ordinary individual can't understand;” but he thinks that Andrew Jackson may have been right when he said: “If there's something too complicated for the average individual to understand, the damned thing ought to be destroyed.”

With this Mr. Boren asked Mr. Kerr to list the criteria by which a given rate is fixed, and added the “challenge”

that if the witness could not answer, the rate structure “means nothing.” Mr. Kerr had no “scientific formula” for fixing rates. Mr. Boren later defined his position as being “unfriendly to things not understandable”—not unfriendly toward railroads. Meanwhile Mr. Bulwinkle had called for the “regular order” and Judge Fletcher resumed, addressing himself to the committee-of-six recommendation calling for an extension to I. C. C. power with respect to intra-state rates in connection with general readjustments of interstate rates.

The railroad complaint in this connection, the A. A. R. general counsel explained, is about the money lost as a result of procedural delays in getting intra-state rates readily into line with adjustments authorized in interstate rates. Thus the committee-of-six bill will propose to write into the law two new sections, one of which would provide that railroads may include in general rate petitions a paragraph embodying a plea to the effect that the proposed adjustment will apply to both intra-state and interstate rates as of the same date. The proposal contemplates that any interested State would be heard in the general investigation, but the present procedure of going back to the I. C. C. in special proceedings to bring intra-state rates into line would be eliminated. The other new section proposed in this connection is designed to cover cases wherein States order intra-state rate reductions; it would give the I. C. C. power to suspend such actions of the States pending an investigation of the issues involved.

* * *

TO BUSINESS MEN AND WOMEN

**Could YOU manage your
business successfully**

**IF YOUR PRICES WERE CONTROLLED BY LAW
WHILST YOUR COMPETITORS WERE FREE?**

**IF YOU WERE COMPELLED AT THOSE PRICES
TO ACCEPT ALL THE JOBS REFUSED BY YOUR
COMPETITORS?**

**These are two of the crippling conditions
under which the Railways have now to
compete for the carriage of your merchandise**

**GIVE THE RAILWAYS EQUALITY
WITH THEIR COMPETITORS**

**GIVE THEM
A SQUARE DEAL NOW.**

SEE YOUR NEWSPAPER

British Roads Assail Rate Restriction in "Square Deal" Campaign

Gigantic Hauling Job Nears Completion

THE Southern Pacific and its highway subsidiary, the Pacific Motor Trucking Company, are rapidly completing the huge transportation job involved in hauling materials for the Colorado river aqueduct. This represents nearly 20,000 carloads of materials including 12,000 cars of cement, 2,400 cars of lumber, 200 cars of poles, 1,400 cars of reinforcing and structural steel, 1,150 cars of pipe, 450 cars of construction equipment and much other material. In all, 3,753,701 barrels of cement were handled by the S. P., of which 2,750,000 barrels were handled in rail-highway co-ordinated service, involving a total truck haul in excess of 1,500,000 miles. During the peak period of this movement, the Pacific Motor Trucking Company had 11 tractors, 22 semi-trailers, 14 dump trucks and 4 miscellaneous units engaged in this service.

The Colorado river aqueduct is 242 miles long, extending from Parker Dam on the Colorado river to Los Angeles. It consists of tunnels through the mountains, of concrete lined canals and of 16-ft., high pressure, pipe lines of concrete and steel. Enroute, the water is lifted



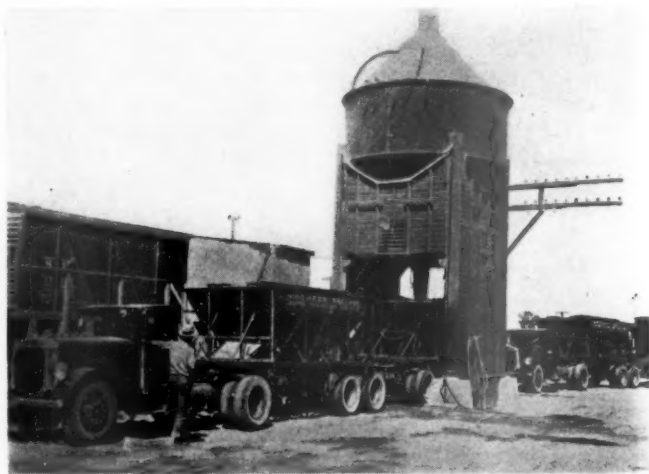
On the Road From the Railhead to the Aqueduct

more than 1,600 ft., over mountain summits, and the project is designed to supply one billion gallons of water daily to the Los Angeles district.

The S. P. railway line runs near to 110 miles of the central portion of the aqueduct, and for the purpose of improving its service, the S. P. established a special bureau in the general freight office at Los Angeles to look after the details of this movement, which began in 1934 and is still in its last stages of completion.

The largest tonnage was cement, and this originated at mills in Colton, Calif., Crestmore, Monolith and Victorville. Some of this moved all-rail, but a large portion received rail-highway handling. Rail to truck transfer points were set up at Mecca, Calif., Indio, Garnet and Cabazon, as shown on the attached map. The longest truck haul necessary from each of these transfer points to the aqueduct was: Mecca, 52 miles; Indio, 20 miles; Garnet, 13½ miles; and Cabazon, 2 miles. Fifteen delivery points were set up at Mecca, Calif., Indio, Garnet and of the transfer points; three from Indio, four from Garnet; and one from Cabazon. The cement was handled by tractors, each pulling two semi-trailers, with loads of between 10 and 11 tons each. These trailers were spe-

cially constructed for this service, as described in the *Railway Age* of March 23, 1935. Between 20 and 22 tons of cement were handled from the railhead to the

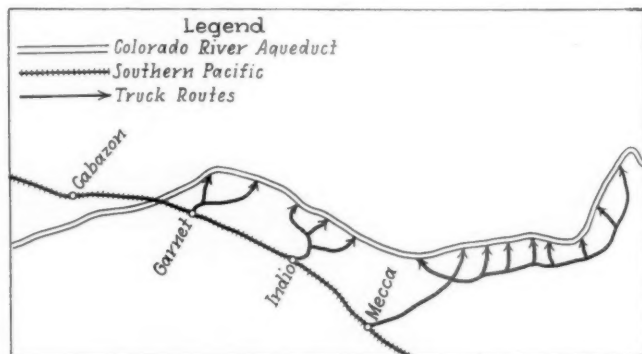


One of the Silos for Transferring Cement from Cars to Trucks

aqueduct by each tractor. This movement and the return of empty trailers was carefully supervised by representatives of the P. M. T. Company on the ground, with the result that the movement was not only efficient, but also was accomplished with an excellent record of safety, despite the mountainous territory and the type of roads.

Three methods were used to transfer the bulk cement from the box cars to the hoppers on the semi-trailers. When the haul was first started, the cement was shoveled from the car into two-wheeled carts, which were pushed on top of the trailers and the contents dumped through the bottom of the cart. A compressed air system was also used. This provided for siphoning the cement from the car through a device resembling a huge vacuum cleaner, from which it was forced through pipes by compressed air into an overhead silo. The trailers were then spotted underneath this silo, and the cement was dumped into the trailers by gravity. Still another system was used later, under which a drag scraper pulled by a winch dragged the cement from a car into a hopper set at the door. The cement was taken from this hopper to the silo by means of a bucket conveyor.

This huge transportation job, extending over a period of six years, is approaching completion, as the aqueduct



How the Southern Pacific Delivered Materials to the Colorado River Aqueduct

itself enters its final stages of construction. It is expected that the last of movement will be completed within the next few months.

Communications and Books . . .

Fooling the Public

TO THE EDITOR:

LA GRANGE, ILL.

In the issue of the "Age" for January 14, at page 111, you ask: How can we ever expect to make democracy work in this country, when the people are not given essential facts upon which to base their decisions?

Quite true. One hears a great deal about the "freedom of the press." Freedom for what? As I understand it, based upon what I see and hear, it means freedom to misrepresent, propagandize and blackmail. I can draw no other conclusion from the vast quantity of printed matter, news-reel and radio. The people should be given a rest from these nuisances for a while.

What profound understanding of abstruse economic problems have we a right to expect from an electorate whose intellectual fodder concerns the doings of such current idols as Three Stooges, the Marx Brothers, Joe Louis, Amos and Andy and Mae West?

A RAILROADER.

[We wish the public did have a deeper interest in its own welfare than it has—and hence that its interest in fundamental economic problems were deeper than it is. On the other hand, freedom includes the right to be mistaken. Anyhow, the antics of our professional entertainers—while they teach nothing of value—at least are less harmful than those of the clowns who monopolize press and radio in deadly seriousness in some less fortunate countries. The radio comedians certainly do less damage than responsible public officials do when they abuse the privilege of the air by using it to spread misinformation about issues which are of vital public importance.—EDITOR.]

"Outside Audits" Held Not Disfavored by I. C. C.

NEW YORK.

TO THE EDITOR:

The two references to "outside audits" of interline revenue accounts, in your issue of February 11, 1939, give the reader the impression that the opinion still persists that the Interstate Commerce Commission frowns on the practice of railroads availing themselves of the services of independent auditors for such work.

On the contrary, the new order of February 2, 1939, by providing rules for reporting pertinent facts respecting the results of the work done by independent auditors, recognizes that such service may, with propriety, be contracted for by the carriers.

If the reason for employing the independent auditors, as expressed in the report which the Commission now requires, is satisfactory, the Commission, in fact, might be inclined to affirmatively favor, rather than to disfavor, the employment. I have in mind, for example, a case in which a carrier, while it may have men on its staff competent to do this work, cannot readily find and assign these men to the special work without disrupting its existing organization and setting up a permanent and costly special department. The employment of independent auditors from time to time on a temporary basis would be likely to cost the road less and the auditors might do a better piece of work.

It is true that the Commission has gone on record as being in opposition to the contingent fee basis, to having outside auditors perform routine accounting and checking for carriers, and to strictly one-sided revenue audits. It is equally true, however, that the Commission is not opposed to the employment of independent auditors who may perform a legitimate service for the carrier in connection with a recheck of its interline revenue accounts; provided there is good reason for the service and it is to be rendered in such a manner that it does not fall under the

criticisms which the Commission has leveled against it in the past.

The Commission's interest in and scrutiny of the information as to the results of independent audits of carriers' revenue accounts should be welcomed both by the carriers and by those who are carrying on this special class of audit work.

WM. E. EPPLER
Partner, Eppler & Company.

Passenger Sales Methods Would Stand Improvement

NEW YORK.

TO THE EDITOR:

I have just received my daily press-release from the Civil Aeronautics Authority. This one deals with air travel for December, 1938. The increase over December, 1937, was 55.5 per cent. The revenue passenger load factor was 48.5 per cent, a rise of 18 per cent. These figures are, in themselves, quite disconcerting.

In addition, I understand that the air industry has subscribed to a \$300,000 fund for joint advertising to promote air travel. A couple of years ago, air travel crossed the million mark in annual revenue passengers. Soon, it will reach 5,000,000, every one of whom typifies the very cream of potential rail patron.

If the rails are to meet this trend, they are not going about it very successfully. Much larger sums need to be devoted to exploiting rail travel. Either passenger traffic should be promoted actively enough to make it *profitable*, or no effort at all should be made to create rail travel. At present, rail advertising, in toto, is, roughly, one-third of that of the automotive industry and less than that in relation to the tobacco industry. Joint advertising to promote passenger travel is an economical means of registering the merits of rail travel, in an objective sense. Unfortunately, some railroads dislike this, feeling that it aids their rail competitors. The answer is that if it aids their neighbors, it automatically aids them, too, for on round-trip, diverse-route tickets to the West, the traveler who is persuaded to make a trip which he otherwise would not make, patronizes two distinct routes, going and returning. The best-known route gets him one-way *always*; hence, the objectors to joint advertising really penalize themselves the most.

I have observed that a large part of the railway passenger solicitation is directed at securing patronage which would move by rail *anyway*. Solicitors spend most of their time trying to divert business from their rail competitors. Few ever start an organized drive to solicit regular air travelers, or to try to build up group movements by rail which otherwise would not move at all.

One reason for this may be the fact that heads of traffic departments are so thoroughly immersed in office details that they do not get enough chance themselves to devote to creative selling; to walking about town with their men, in each city, to watch their work and to make constructive suggestions, in the way that salesheads of other industries do with their salesmen.

By and large, I know no finer men than the sales heads of most railroads, and it is unfortunate that they cannot call a six-months' moratorium on "meetings" with other roads; go out on the firing line and observe why it is that the air-lines are making such impressive strides in passenger carryings (at the railroads' expense).

I realize that when anyone casts any reflection upon rail methods he is privately branded as a fool, a "nut" and a person to shun publicly and officially by some members of the fraternity, but, happily, this attitude is gradually breaking down, in the more progressive railroads. If any railway traffic head wants to get passenger business badly enough to spend a week in any Eastern city walking about town getting ideas (*not* from railroad agents, but from travelers, newspapermen, travel agencies and advertising and publicity experts) it doubtless would be

brought home to him that far too much time is wasted stealing passengers from other roads, and far too little in creative selling. He might also surmise why this is unfortunately the case.

FRANKLIN SNOW.

The Hoghead's Howl

SALT LAKE CITY, UTAH.

TO THE EDITOR:

I am a constant reader of railroad books and papers and find *Railway Age* one of the most interesting of these.

I was opposed to the wage cuts on all classes of employees; however, I don't think a small cut would hurt the train service employees. I am opposed to the seventy-car law. I don't prejudicially favor either the management or the unions. I do believe, however, that the unions are somewhat of an enemy of the young employee when they allow and protect hog practices that enable the older employees to do all the work.

The young employees are somewhat to blame for this, too. I asked a young employee what he thought of a mileage law for the limiting of miles to about 3300 a month. He said it didn't make much difference to him for even though he hadn't worked for over a year he would like to be able to hog as much as the rest of them when he gets old. A mileage law like this can be enacted in the unions by outvoting the old heads. Instead of blaming bad business and big engines all the time as the cause of their being layed off, if they would realize that is their own inactivity and "don't care" attitude that is the cause they would be far better off because then they would realize that they could do something about it. However, it would not be easy because the old heads have an attitude which is best expressed in the following original poem.

Cut the Board, Cut the Board,
Old Big George, the hoghead roared.
How do you expect my smiles
If I can't pile up the miles?

Where's that grievance man, the fool
There's too many in the pool.
I can't put on the dog
If I can't get out and hog.

Cut the Board, Cut the Board,
Old Big George, the hoghead roared.
How can I put on a front
On only three hundred bucks a month?

The young bucks can earn their pay
When I lay off on Christmas day;
Other times they needn't shirk
There's extra gangs and public works.

Cut the Board, Cut the Board,
Old Big George, the hoghead roared.
Someone's gona' get in trouble,
It don't look like I'm gona' double.

What me quit this job at sixty-five?
A pension won't keep me alive;
My wife would soon look like a hag
If I weren't out a jerking drags.

Cut the Board, Cut the Board,
Old Big George, the hoghead roared.
One night old George fell fast asleep,
From him we never heard a peep.

But in the morning if he's not out
You will hear a mighty shout.
It's George a howling to the Lord
To Cut the board, Cut the board.

WESTERNER.

New Books...

Railways To-Day, by J. W. Williamson, B. Sc. 160 pages. 8½ in. by 5½ in. Bound in cloth. Published by the Oxford University Press, London, New York, Toronto. Price, \$1.50.

An excellent popular book describing modern British railway practice, this work is part of a series of volumes presenting the highlights of various branches of industry and science, entitled "The Pageant of Progress." The author of "Railways To-Day" has already demonstrated his ability to present the interesting elements of railroad operation in a previous volume "A British Railway Behind the Scenes." In comparison, the volume at hand is broader and more general in scope.

A brief space is given to historical data. The remainder of the work is an informal discussion of phases in train operation—roadway, track, locomotive running and repair, car types and maintenance, signaling, operating techniques and late developments. The sections devoted to operation are probably more satisfactory than those of the average popular work of this type, since they not only stick to the facts but present as well a clear picture of procedures difficult to explain to the layman.

A number of well-selected photographs back up the text.

The Railway Interrelations of the United States and Canada, by William J. Wilgus. 304 pages. 9¾ in. by 6½ in. Bound in cloth. Published by the Yale University Press, New Haven, Conn., and the Ryerson Press, Toronto, Ont. Price, \$3.00.

Along the 4,000-mile border between the United States and Canada the railway systems of the respective countries are joined at some 50 international gateways, through which passed, in the depression-year 1933, over 23,000,000 tons of freight, equal to nearly a third of the total volume of freight traffic in Canada during that year. Not only are the rails of both countries linked at these points, but more than 7,300 miles of Canadian-controlled lines dip into United States territories and over 1,500 American-owned miles of line reach up into the Dominion.

It is the extent of this inter-relationship of the two countries and its significance for each that comprises the theme of Col. Wilgus' scholarly volume. First he describes minutely the physiography of the border country which has shaped the channels of commerce between the two nations.

Chapter II presents a chronological outline of the growth of cross-border traffic routes, first by pre-railroad transportation media, then by increasing railroad links starting with the first railroad run between Montreal, Que., and Boston, Mass., via Rouses Point, N. Y., in 1851.

Subsequent chapters describe the growth and present status of each of the 50 gateways, classified as the Northeastern, Great Lakes and Northwestern. Chapter VII ties up statistics for the gateways as a whole. Among other things it gives cross-border tonnages both during the current contraction in traffic and in the lush days of 1920-1929 and notes in detail the holdings of American roads in Canada and Canadian roads in America. A further chapter analyzes cross-border facilities of importance such as the Niagara bridges and the Detroit river tunnel. Still another compares significant characteristics of the United States and Canadian railroads, touching upon such topics as relative traffic volume, revenues, expenses, financial results, etc. A subsidiary chapter discusses in detail the rate structure as applied to the two countries and a short final chapter presents the author's conclusions.

Replete with tables and detailed maps, this book gives exhaustive treatment to one of the most interesting and significant phenomena of international co-operation in existence. No detail is omitted, for the author has ignored no possible source of information. He was personally engaged in the construction of the Detroit tunnel, the Terminal railway at Buffalo, N. Y., and the Van Buren bridge between Maine and New Brunswick. In addition to study of the information founded in ordinary sources of record, he carried on an extensive correspondence with the officers of 17 railroads, 5 public authorities and 7 independent experts, from whom he presents the more vital facts.

The theme was originally suggested in 1934 by Dr. J. T. Shotwell of the Carnegie Endowment for International Peace and hence the book primarily serves to emphasize the inter-play between Canada and the United States at the "unarmed frontier."

NEWS

Court Holds R. R. "Town Meeting"

Creditors and customers of O. & W. invited to tell what they want done with road

Over 150 security holders, shippers and representatives of towns along the line of the New York, Ontario & Western took advantage of an informal hearing scheduled by Federal Judge Murray Hulbert in New York on February 20 to discuss the present status of the bankrupt road and the probabilities of its future traffic and earnings.

After hearing a report by Trustee Lyford and the general counsel on plans for the future, Judge Hulbert reminded the "town meeting" that the road has been in reorganization since May, 1937, "almost two years," and declared that "the court has no interest in continuing these proceedings indefinitely, as is the case with many railroad reorganizations, much to the public's disgust." In this connection, he warned those present that while to throw the road into equity receivership might mean a forced sale and possibly dismemberment, he could not permit either security-holders or patrons to impose indefinitely upon the court's protection in the hope that "George might do it."

The hearing was then thrown open to interested parties. A lawyer from Ft. Wayne, Ind., who was "interested" in the road, outlined a plan whereby bond and stock owners would furnish necessary new money to rehabilitate the road and re-open certain anthracite mines located thereon. Following him, the holder of a single mortgage bond affirmed his faith in the line and his willingness to contribute financially.

Representatives of towns along the line then took the floor. Coming from towns located all along the road between Cornwall, N. Y., on the Hudson river, and Oswego on Lake Ontario, ranging in population from Utica's 100,000 to Richmond Falls' 850, and in economic character from Rome, a center of heavy metal products, to Walton, a shipping center of rich, agricultural Delaware County, the mayors, attorneys, Chamber of Commerce officers and shippers one by one pleaded with the court to keep the road open and grant more time to work out the line's reorganization. While apparently only one town committed itself to definite action in aid of the road, practically every representative "pledged the fullest possible cooperation" with court and trustee. Many pointed to recent concessions granted in tax assess-

ments and hinted at possible further reductions. The Chamber of Commerce of Middletown, which is the operating center of the road and has over 1,000 citizens on its payroll and the largest stake in its continued operation, has appointed a committee of business men for the purpose of soliciting traffic for the road in a "Ship by Rail" campaign.

In reply to pleas of the town collector of Kingston, N. Y., located at the end of a light-traffic branch, for continued service, Judge Hulbert said he had received correspondence urging that the Kingston branch be kept open in winter because the highways are not cleared of snow punctually to permit easy movement by road vehicles. Commenting thereon he observed that "in the summer these same people forget all about the trustee and his railroad."

A representative of Oriskany Falls, population 900, pointed out that the total O. & W. freight bill collections in the town amounted last year to \$100 per capita, and declared that abandonment would mean "ruination and loss of our jugular vein."

A representative of Oswego declared that there would have been no trouble filling a special train with citizens desiring to make the 654-mile round-trip journey to attend the hearing. The general traffic manager of the Borden Company, large distributors of milk and dairy products, told the assembly that "if shippers continue to use trucks it won't be long before the road will close."

Employees groups were also represented. An attorney appeared for the Textile Organizing Committee, a C. I. O. affiliate, and presented a petition signed by employees of knitting mills in Utica to keep the road going, as its abandonment might jeopardize their jobs. A representative of the railroad's own employees also outlined their stake in the road and reported their activities in individual traffic solicitation.

Judge Hulbert adjourned further hearings until May 13, declaring that the day's session had been "constructive."

10,977 Air-Conditioned Cars

Class I railroads and the Pullman Company had 10,977 air-conditioned passenger cars in operation on January 1, according to reports made public February 20 by the Association of American Railroads. This was an increase of 652 compared with the number of air-conditioned passenger cars on January 1, 1938. Of the total number of such cars, Class I railroads on January 1 this year had 6,022, an increase of 458 compared with the same date last year. The Pullman Company on January 1 this year had 4,955 air-conditioned passenger cars in operation which was an increase of 194 compared with January 1, 1938.

I. C. C. Opposes Rate Revamping

Eastman gives Wheeler the Commission's views on four pending bills

Commissioner Joseph B. Eastman, acting in his capacity as chairman of the legislative committee of the Interstate Commerce Commission, has written two letters to Chairman Wheeler of the Senate interstate commerce committee in which he gives the commission's views on S. J. Resolution 27, introduced by Senator Hill, Democrat of Alabama, and on Senate bills S. 126, S. 137, and S. 158, introduced by Senators McKellar, Democrat of Tennessee, Bankhead, Democrat of Alabama, and Hill. The Senate joint resolution proposes an addition to the Hoch-Smith Resolution, and directs the commission to make an investigation of the level of rates throughout the country maintained by the common carriers subject to the Interstate Commerce Act, and the causes of differences in the rate levels of different sections and as between different sections or rate territories. The resolution also directs the commission to enter orders requiring that such differences be removed when, after investigation, they are found to be unlawful under any provision of the Act.

Commissioner Eastman first says that the resolution should be clarified in respect of whether it is intended to apply to common carriers by motor vehicle under Part II of the Act, or if it is intended to apply only to those transportation agencies which were common carriers under what is now Part I of the Act.

The chairman of the legislative committee of the commission then goes on to point out to Senator Wheeler that "The subject of the causes of differences in rate levels, so-called, is under constant investigation by us as issues of preference and prejudice between territories, and the reasonableness of rates within and between territories, are heard and decided. No additional legislation is necessary to empower us to make such investigations, or to enable interested parties or localities to present such issues for determination."

The Commissioner then says that the commission's experience showed conclusively that general investigations of rates on particular commodities throughout the country or in large sections thereof, or similar investigations of class rates, are "very time-consuming and burdensome to all concerned." It is also observed that

complaints with respect to particular rate situations presented by those who deem themselves to be aggrieved can ordinarily be determined with greater expedition and less burden.

The Commissioner concludes his first letter to Chairman Wheeler by saying that "The Act gives full opportunity to any who feel that a particular rate adjustment is unjust, unduly preferential, or otherwise unlawful to complain to the Commission and secure an adjudication. We have before us now, for example, a complaint attacking the interterritorial rates from the South to the North on a number of important commodities. Not only that, but the Commission will always receive and consider requests that it institute investigations of particular rate adjustments on its own motion. Thus, on petition of southern State Commissions two years ago, we instituted an investigation of the southern class rate structure, and would have prosecuted this investigation to a conclusion, had not petitioners found difficulty in taking active part in the inquiry and acquiesced in its discontinuance."

"However, we are of course ready and willing to undertake such investigations as the Congress may desire us to undertake, and from this point of view we have no objections to offer to S. J. Res. 27. We suggest, however, that if such a joint resolution is to be enacted, it would be desirable, for the present, to confine it to particular situations deemed to be most in need of investigation. As the joint resolution is now drawn, it covers all the freight rates of the country."

In his second letter expressing the commission's views on the three bills, the commissioner says that they have much in common. S. 126 and S. 158, he says, would establish the principle for common carriers subject to Part I of the Act that, distance considered, the freight rates on commodities moving into a rate-making or geographical area of the country shall be no higher than the rates which apply locally on the same commodities within that area. Although this principle is not stated definitely in S. 137, the Commissioner believes the objective to be similar. It is also pointed out that S. 126 and S. 137 seek the establishment of a reasonably uniform national system of freight rates.

On the subject of the bills, the commissioner says that the first issue of whether or not rates on commodities moving into an area shall be no higher than those applying within the area, "is being keenly contested in a formal proceeding pending before us, which involves a considerable portion of the railway freight tonnage of the country, and in which it is contended that we can and should be governed by this principle under the present provisions of the Act. The proceeding has passed through the stage of testimony, and is awaiting a proposed report by our examiner, after which we shall hear and determine any exceptions made to his findings and conclusions. It would scarcely be appropriate for us to express views upon these bills which might seem to pre-judge the issue before us in so important a proceeding, undetermined but receiving active consideration. For similar reasons we hope that before the Congress exer-

Quits In Tiff Over Hungerford

J. Y. Murdoch, director of the Canadian National and head of the large mining properties at Noranda, P. Q., has resigned from the C. N. R. board in protest at the reappointment of S. J. Hungerford as president of the railways.

This situation was revealed by Transport Minister Howe at Ottawa this week when he made public correspondence between himself and Mr. Murdoch. The C. N. R. board voted, however, to continue Mr. Hungerford in office despite Mr. Murdoch's criticisms, which were to the effect that the C. N. R. head had not replied with sufficient vigor to the attacks made upon the system's decision to complete its Montreal terminal. In general, Mr. Murdoch contends that the C. N. R. chief executive should be interpreting the System's position in public addresses to match those delivered by Sir Edward Beatty, president of the Canadian Pacific.

cises its undoubted power to regulate interstate commerce by acting directly in formulating a rule, such as is proposed, it will, because of the possibly far-reaching effect upon the economic well-being of the carriers and the shipping public, give interested parties full opportunity to present their views."

The commission does feel, however, that there are certain comments bearing upon the practical operation of the bills that it can make at this time. In the first place, it feels that it would be impracticable to apply the proposed rule with respect to rates from one rate-making or geographical area to another without fixing the rates substantially on a mileage basis. Examples are then given of the rates on citrus fruits from California, which are blanketed on the destination end all the way from the Rocky Mountains to the Atlantic seaboard without any substantial complaint, according to the commission.

"To apply the proposed rule in such cases," asserts the commission, "a complete readjustment of the rate structure would be necessary. It may be said that the rule only requires rates into the destination area which are no higher relatively than the corresponding local rates, and that the blanket rates on citrus fruits, lumber and the like are relatively lower. But that in itself may be offered as an objection to the rule, on the principle that it is a 'poor rule that does not work both ways.'"

Another criticism of the proposed rule is that it would apply, not only to all-rail rates, but to rail-water rates as well. Much traffic, it is pointed out, moves between the South and the East by rail-water routes via the coastwise steamship companies. From the standpoint of cost, the commission says, water mileages are, of course, not comparable with rail mileages; and this fact presents another practical difficulty to the application of the rule.

The commission also feels that the pro-

posed rule gives consideration only to distance in fixing the rate. "In theory," it says, "there is as much reason why rates should vary with other factors which affect cost as with distance." The commission also believes that the rule would produce, under certain conditions, lower rates in one direction than in the other over the same routes and between the same points, notwithstanding the similarity in physical transportation conditions.

Concluding his second letter, Commissioner Eastman, speaking for the commission, warns that the freight rates in the different sections of the country reflect the character of the industrial conditions in those sections. He goes on to point out that "While the freight rate structure of the country has many seeming inconsistencies, it is, after all, largely the product of evolution and adjustment to practical conditions, and any attempts to recast it abruptly into a radically different form in disregard of such conditions, is likely to have results more disturbing than beneficial."

Hearings on the Senate bills and the joint resolution are scheduled for February 27 before a subcommittee headed by Senator Hill.

Tax Commissioners to Meet March 14

The Western Association of Railway Tax Commissioners will hold its annual meeting on March 14 in the Hotel La Salle, Chicago.

Equipment Depreciation Rates

Equipment depreciation rates for seven railroads including the Boston & Maine have been prescribed by the Interstate Commerce Commission in a new series of sub-orders and modifications of previous sub-orders in No. 15100, Depreciation Charges of Steam Railroad Companies. The composite percentages which are not prescribed rates range from 2.91 for the B. & M. to 10.96 for the Southern New Jersey.

The sub-order relating to the B. & M. is a modification of a previous sub-order, and it prescribes rates as follows: Steam locomotives, 3.01 per cent; other locomotives, 3.1 per cent; freight-train cars, 2.91 per cent; passenger-train cars, 2.63 per cent; work equipment, 3.67 per cent; miscellaneous equipment, 14.07 per cent.

January Locomotive Shipments

The country's principal manufacturing plants shipped 23 locomotives in January as compared with 35 in January, 1938, and 25 in January, 1937, according to reports received by the Bureau of the Census, United States Department of Commerce. Unfilled orders at the end of January totaled 91 locomotives, as compared with unfilled orders for 156 on January 31, 1938.

The 23 locomotives shipped in January were all for domestic service, and included three steam locomotives, four electrics and 16 Diesel-electrics; of the 35 shipped in January, 1938, 25, including 14 steam and 11 Diesel-electrics, were for domestic service, and 10 steam were for export. The 91 locomotives involved in the unfilled orders on January 31 included five steam,

20 electrics and 54 Diesel-electrics for domestic service, and six steam, four electrics and two Diesel-electrics for export.

The foregoing figures do not include locomotives built in railroad shops, "or self-propelled cars of any description."

Southwest Board Meeting

The fiftieth regular meeting of the Southwest Shippers Advisory Board will be held at Harlingen, Tex., on March 2. Robert S. Henry, assistant to the president of the Association of American Railroads, will speak at the morning session, on Transportation and Taxation. H. B. Lockett, chairman of the Joint Loss & Damage Prevention Committee and traffic manager of the John Deere Plow Company of Dallas, will outline plans for the April Perfect Shipping and Careful Handling Campaign. At a luncheon sponsored by the Rio Grande Valley Traffic Club, C. W. Vandervort, secretary of the Growers Industry Committee, Weslaco, Tex., will speak on The Past, Present and Probable Future of the Fruit and Vegetable Industry of the Rio Grande Valley.

Burlington Gets Truck Route

In an unanimous decision by Division 5, the Interstate Commerce Commission has approved, subject to conditions, the purchase by the Burlington Transportation Company, affiliate of the Chicago, Burlington & Quincy, of the Arrow Stage Lines' bus operating rights on a route between Sioux City, Iowa, and Omaha, Nebr. After noting that the vendors' objections to one of the recommended findings was "untenable" the commission adopted Examiner J. Edward Davey's proposed report which was reviewed in the *Railway Age* of September 17, 1938, page 416.

Joint Board No. 52, composed of Ernest E. Blincoe of Kansas, has recommended in a proposed report that the commission grant a common-carrier trucking certificate to the Santa Fe Trail Transportation Company, affiliate of the Atchison, Topeka & Santa Fe, for a route between Florence, Kans., and Eldorado.

Celler Discusses RFC Loans to Railroads

During a discussion of H. R. 4012, the bill to extend the lending authority of the Reconstruction Finance Corporation to Jan. 15, 1941, in the House on February 20, Representative Celler, Democrat of New York, told the members that "Of the \$1,248,348,560 loan commitments to railroads, (by the RFC) \$200,460,500 representing securities purchased from P. W. A. \$307,561,724 was not used, the purposes for which the authorizations were made not being carried into effect, or the roads having an RFC commitment were able to get the money from private sources." A total of \$826,773,161, he added, has been disbursed to 82 roads; \$346,509,316 of this has been paid, leaving a balance outstanding of \$480,263,845 due from 50 railroads. Thirty-two roads have paid their loans in full. Nineteen were placed in receivership or trusteeship after receiving loans. Three of these are no longer indebted to the Corporation. The balance due from the remaining 16 roads in the custody of the

courts aggregates \$168,565,837. Interest is being paid currently on two of these, the loans of which aggregate \$25,825,227.

Mr. Celler went on to say that the RFC will have some individual losses on railroad loans, as in other classes of borrowers, but, treated as a class, there should be little net loss on railroad loans.

The House and Senate have both passed bills extending the life of the RFC, and differences will be ironed out in conference.

Freight Car Loading

Revenue freight carloadings for the week ended February 18 totaled 580,071 cars, the Association of American Railroads announced on February 23. This was an increase of 153 cars over the previous week, an increase of 44,205 cars, or 8.2 per cent, above the same week in 1938, and a decrease of 131,243 cars, or 18.5 per cent, below the corresponding week in 1937.

As reported in last week's issue, the loadings for the previous week ended February 11 totaled 579,918 cars, and the summary for that week, as compiled by the Car Service Division, A. A. R., follows:

Revenue Freight Car Loadings			
For Week Ended Saturday, February 11			
District	1939	1938	1937
Eastern	131,358	113,061	155,531
Allegheny	115,012	97,822	147,944
Pocahontas	42,782	39,918	49,321
Southern	92,136	91,082	99,422
Northwestern	63,724	65,079	76,849
Central Western ..	89,802	88,284	103,677
Southwestern	45,104	47,745	55,779
Total Western Districts	198,630	201,108	236,305
Total All Roads...	579,918	542,991	688,523
Commodities			
Grain and Grain Products	28,809	32,256	29,598
Live Stock	9,700	11,015	11,613
Coal	135,143	107,875	155,322
Coke	7,215	5,505	12,143
Forest Products ..	23,539	26,853	35,091
Ore	8,429	7,136	11,071
Merchandise L.C.L.	148,404	146,897	162,813
Miscellaneous	218,679	205,454	270,872
February 11	579,918	542,991	688,523
February 4	576,790	564,740	671,227
January 28	594,379	553,176	653,022
January 21	590,359	570,233	665,346
January 14	586,877	580,740	696,035

Cumulative Total,
6 Weeks

In Canada.—Carloadings for the week ended February 11 totaled 39,227, as compared with 43,634 for the corresponding week last year and 40,430 in the preceding week, according to the compilation of the Dominion Bureau of Statistics.

	Total Cars Loaded	Total Cars Rec'd from Connections
Total for Canada:		
Feb. 11, 1939.....	39,227	22,941
Feb. 4, 1939.....	40,430	22,461
Jan. 28, 1939.....	40,175	22,421
Feb. 12, 1938.....	43,634	21,601
Cumulative Totals for Canada:		
Feb. 11, 1939.....	237,576	135,359
Feb. 12, 1938.....	268,612	133,031
Feb. 13, 1937.....	277,884	161,010

Rio Grande-Delta Traffic League Organized to Seek Rate Adjustments

The Rio Grande Delta Traffic League has been organized by merchants, citrus fruit shippers, canners and growers, and individuals in other lines of business, to wage a three year program to obtain "more satisfactory freight rates" for the Rio Grande Valley. A fund of \$30,000 an-

nually is expected to be needed. Speakers at the initial meeting were William Wagner, secretary of the United Fresh Fruit and Vegetable Association, Joseph Porter, traffic manager of the Port of New Orleans Port Commissioners; and James C. Bowie, manager of the Port Isabel Port. Because of the Texas differential, according to Mr. Porter, rates in the southern territory are 139 per cent, in the western trunk line territory 147 per cent, in the southwestern territory 175 per cent and the Mountain Pacific territory 171 per cent of those in official classification territory.

Reshipment Rule in Stocker-Feeder Tariffs

The Interstate Commerce Commission has found unreasonable a tariff rule which makes reshipment by rail carriers a condition precedent to final application of stocker-feeder rates on stocker and feeder livestock between points in British Columbia, Arizona, California, Idaho, Montana, Nevada, western New Mexico, Oregon, Utah and Washington, on the one hand, and territory east of those states on the other.

The decision in No. 27674, Matador Land & Cattle Company, Limited, v. Atchison, Topeka & Santa Fe Railway Company et al., requires the cancellation of the rule "without prejudice to any different conclusion . . . which may be reached in the reopened *Livestock—Western District Rates*," upon the broader record therein made. Chairman Caskie and Commissioner Rogers did not participate in the disposition of the case.

Bills Introduced in Congress

Senator Minton, Democrat of Indiana, has introduced in the Senate S. 1512, a bill to amend the Motor Carrier Act, so as to give the Interstate Commerce Commission certain powers over those intrastate motor carrier operators whose business, the commission finds, is so largely interstate or foreign that it is affected with an important national interest. A new section, 209 (c) would be added to the Act defining the commission's power over intrastate carriers.

Senator Connally, Democrat of Texas, has offered S. 1483, a bill which would make it unlawful for any railroad to discriminate against any section of the country in the matter of rates. This bill is similar to several already introduced by other southern Senators this session.

Senator Bilbo, Democrat of Mississippi, has introduced S. 1423, a bill to amend section 204 of the act terminating the federal control of railroads. The bill adds four new paragraphs which define certain terms dealing with the settlement of claims by carriers growing out of the operation of the railroads by the Government.

Representative Powers, Republican of New Jersey, has introduced in the House, H. R. 4318, a bill to amend the Railroad Retirement Act of 1937 so as to provide for payment of benefits with respect to the month in which the annuitant or pensioner dies. The bill provides that an annuity shall accrue with respect to the month in which an annuitant dies; except

that if death occurs on or before the 15th day of such month, only one-half of the annuity for such month shall be considered to have accrued. The same treatment would be accorded pensioners.

Representative Shanley, Democrat of Connecticut, has offered a bill, H. R. 4323, to provide for World War service as time to be counted as service in qualifying for retirement under the Railroad Retirement Act.

Sound Movie from Australia

On February 17 a sound moving picture showing the construction of the "Spirit of Progress," the semi-streamline, air-conditioned train constructed of Cor-Ten steel by the Victorian State Railways of Australia in its own shops in 1937, was witnessed by a party of railway officers and officers of railway supply companies at New York as guests of The Alloys Development Corporation and the United States Steel Corporation. The train, which consists of nine coaches, represents the latest progress in passenger-car construction in Australia.

The picture shows clearly the various steps in the process of construction, including the building of the underframes, the construction of the sides and roofs on jigs, and the final assembly of the parts. The parts of the various crafts in the building and furnishing of the cars are all clearly but briefly depicted. The picture concludes with the ceremonies at which the premier of Victoria officially named the train and Harold W. Clapp, chairman of Railway Commissioners, described the principal features of the train before it started on its inaugural trip.

Rankin Writes of Rate Discrimination

The Appendix of the Congressional Record for February 20 contains an extension of remarks by Representative Rankin, Democrat of Mississippi, in which he inserts in the Record a copy of a letter from J. F. Scullen, president of the Belle Glade Chamber of Commerce, at Belle Glade, Fla., in which the latter complains of the freight rate discrimination on citrus fruits from Florida.

Commenting on the letter, Mr. Rankin said that "It is bad enough for business generally, and for the farmers in particular, in the various sections of the country, to suffer as a result of these freight rate discriminations. But it is infinitely worse when they contribute to wrecking the health and destroying the lives of innocent people, and especially of little children in the manner in which I have pointed out in my letter to Mr. Scullen." Mr. Rankin referred to his answer in which he pointed out that the high freight rates on Florida citrus fruits was depriving children in other parts of the country from getting the necessary vitamins and minerals to aid them in their normal development.

Club Meetings

The next meeting of the Toronto Railway Club will be held on February 27 at the Royal York Hotel, Toronto, Ont., at 7:45 p. m. The speakers at the meeting,

which has been designated as "Maintenance of Way Night," will be B. Wheelwright, engineer, maintenance of way, Canadian National, Toronto, and A. O. Wolff, assistant district engineer, Canadian Pacific, Toronto.

The Canadian Railway Club will hold its next meeting on March 20 at 8:15 at the Windsor Hotel, Montreal, Que. T. V. Buckwalter, vice-president Timken Roller Bearing Company, Canton, Ohio, will present a paper entitled "Steam Locomotive Slipping Tests."

The next meeting of the Indianapolis Car Inspection Association will be held on March 6 at the Hotel Severin at 7 p. m. A paper entitled "Wheel Defects" will be presented by F. H. Hardin, president, Association of Manufacturers of Chilled Car Wheels, together with a sound motion picture entitled "How Wheels Are Made."

The Car Foremen's Association of Omaha, Council Bluffs and South Omaha Interchange will hold its next meeting on March 9 at the Union Pacific headquarters in Council Bluffs, Iowa. F. M. Reznor will discuss "Rule 32."

Status of Stockyard Companies

The Interstate Commerce Commission has assigned its Ex Parte No. 127 investigation of the status of public stockyard companies for hearings before Commissioner Splawn and Examiners Carter and Haden at Omaha, Nebr., on March 20 and at Washington, D. C., on April 17. The notice states that dates for other hearings will be announced later.

At the Omaha hearing, which will be held in the Fontenelle Hotel, evidence will be received with respect to the following companies:

St. Paul Union Stockyards Company, South St. Paul, Minn.
Sioux City Stock Yards Company, Sioux City, Iowa.
Kansas City Stock Yards Company, Kansas City, Mo.
Union Stock Yards Company of Omaha, Ltd., Omaha, Nebr.

At the Washington hearing evidence will be received with respect to the following stockyards:

Buffalo Stock Yards (New York Central Railroad, owner or operator), Buffalo, N. Y.
Pittsburgh Joint Stock Yards Company, Pittsburgh, Pa.
West Philadelphia Stock Yards Company, Philadelphia, Pa.
Brighton Stockyards Company, Boston, Mass.
Union Stock Yards and Market Company, Inc., New York, N. Y.

Pennsylvania Washington Bridge Damage Placed at \$50,000

Some 600 feet of double-track timber bent trestle which carries the freight line of the Pennsylvania over the Anacostia river in Washington, D. C., was destroyed by fire on February 19, at a loss estimated at about \$50,000. The trestle caught fire at 10:25 p. m., February 19, at a point 250 ft. south of a draw span which forms part of the structure. A fire-boat of the Washington Fire Department and a yard shifting locomotive were called and the fire was under control by 12:45 a. m., February 20, and extinguished by 5:15 a. m.

The fire destroyed the bridge from the south end of the draw span to the south abutment of the bridge, burning out 21 double bents and 36 single bents in each

track. Men and materials were assembled immediately and with forces working from each end of the damaged portion, efforts made to restore the southward track. The latter was accomplished for 10 m. p. h. operation at 2:58 a. m., February 23. In the meantime, freight trains were routed over the Washington Terminal tracks through Union station territory from Landover on the north to a connection with the freight line in South Washington, and little delay was experienced.

The cause of the fire remains undetermined at date of writing.

Operating Authority Reviews James J. Hill's Accomplishments

A story of the achievements of James J. Hill in building and improving the properties of the Great Northern, originally embodied in a paper prepared for the Newcomen Society by Duncan J. Kerr, president of the Lehigh Valley and a member of the society, has been published in a 46-page booklet together with Mr. Kerr's paper on "Preliminary Studies and Results of Improving the Cascade Crossing" reprinted from the 1932 transactions of the American Society of Civil Engineers. The author, who was connected with the Great Northern from 1913 to 1937 and a close associate of "Jim" Hill until the death of the latter in 1916, reviews the early efforts of "the empire builder" in organizing the St. Paul, Minneapolis & Manitoba and its transcontinental undertaking later re-organized as the Great Northern. Later activities in improving the road and the fascinating story of construction through Marias Pass and the Cascade tunnel are also described.

To bring the story of the road up to date, Mr. Kerr outlines the careers of subsequent Great Northern presidents,—Ralph Budd and the late W. P. Kenney, together with the building of the new Cascade tunnel. Since the author is primarily an operating man and an enthusiastic student of Hill's theories and methods, the work is particularly significant for its coverage of such details as grade and curvature improvement, train tonnages and motive power utilization.

I. C. C. Holds Hearings on Motor Safety Rules

Hearings were held before the Interstate Commerce Commission during the past week on two matters of importance to the trucking industry. On February 16, Commissioner Lea heard testimony on new proposed safety rules for both personnel and equipment of trucking companies. The witnesses testified regarding certain specifications for equipment proposed by the Bureau of Motor Carriers of the commission.

On February 20, the Bureau of Motor Carriers held a hearing to determine whether or not it should lay down rules and regulations governing maximum hours of employees and safety of equipment of private carriers. Generally the private truckers were opposed to regulation, but some stated their position as being unopposed to regulation in principle but they could see no need for it.

Joseph Padway, general counsel for the

LIMA POWER AT WORK



SPEED is not a Limitation of the Steam Locomotive

Super-Power Steam locomotives provide speed and hauling capacity combined with flexibility of train operation, safety, low first and low maintenance cost. » » » Without introducing a single unproven element Lima-built Super-Power locomotives are available to give you exactly the performance you want, in any class of service.

LIMA LOCOMOTIVE WORKS



INCORPORATED, LIMA, OHIO

American Federation of Labor, refused to participate in the hearing, and issued a statement on behalf of himself, Tom O'Brien and Fred Tobin of the International Brotherhood of Teamsters, Chauffeurs, Stablemen and Helpers, criticizing the commission for its recent decision in the motor carrier hours-of-service case. Mr. Padway said that he could see no "advantage to the public or to the organized workers in the industry by participating in this hearing since the clock has been turned back over 20 years insofar as the interests of the workers and the public in the transportation industry are concerned."

R. F. C. Has New Plan for M. & St. L. Reorganization

Chairman Jesse Jones of the Reconstruction Finance Corporation disclosed this week that his corporation and interests represented by W. W. Colpitts of the firm of Coverdale & Colpitts of New York City have had under discussion a proposal for the reorganization of the Minneapolis & St. Louis by dividing it into two companies.

Chairman Jones, in a letter to Mr. Colpitts, said that if the plan were approved by the court having jurisdiction and the Interstate Commerce Commission, the RFC would give favorable consideration to lending up to \$5,000,000 to be secured by a first mortgage not exceeding \$7,500,000 in total amount. Any bonds in excess of the RFC's loan, Mr. Jones wrote, would be subject to the corporation's approval and not in excess of two-thirds of the cost or the fair value of the property additions, and provided that the earnings of the company for 18 months prior to the issue had averaged at least 1½ times the fixed charges, including the new bonds to be issued. In addition, according to the RFC chairman, the corporation would require a fixed sinking fund of \$25,000 a year for the first five years and an additional \$50,000 a year thereafter, if earned.

Mr. Jones also pointed out that the reorganization of the railroad should probably be effected through a division of the property, one corporation to own the lines between Minneapolis and Peoria, with appurtenant branches, Hopkins and Winthrop, Oskaloosa and Albia, Oskaloosa and Tracy, and Albert Lea and Des Moines, comprising 904 miles, and the other corporation owning the remainder of the property, totaling 519 miles.

New Chicago-San Francisco Train in Service June 10

A new Chicago-San Francisco, Cal., train to be known as the Exposition Flyer will be placed in service by the Chicago, Burlington & Quincy, the Denver & Rio Grande Western and the Western Pacific on June 10. The train will operate on a 57 hr. schedule westbound and a 60 hr. schedule eastbound for the 2,532 miles, as compared with the present through sleeping car service which requires approximately 80 hr., including layovers. The Exposition Flyer will leave Chicago at 3 p. m. and will arrive in Denver at 8:15 a. m. mountain time, or in 18¼ hr. as compared with the 16 hr. schedule of the Denver Zephyr. It will arrive in San

Francisco at 10:10 p. m., Pacific time, the third evening. Returning it will leave San Francisco at 9 p. m., Pacific time, and arrive in Chicago at 11 a. m., Central time, the third morning.

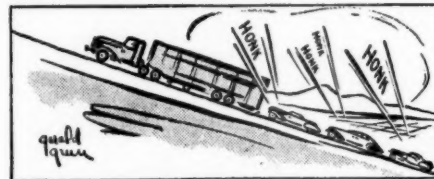
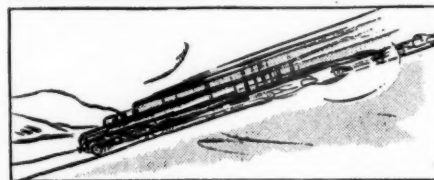
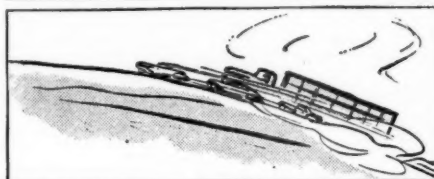
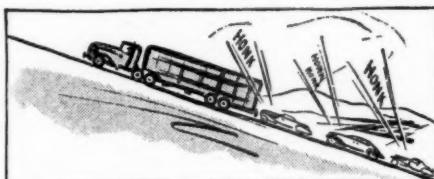
With this schedule the train will traverse a highly scenic route, passing through the Colorado Rockies by daylight by way of the Moffat tunnel and the Gore Canyon of the upper Colorado river. Connecting service and through cars will also be available by way of the Royal Gorge route. The train will also pass through the Feather River Canyon of the Sierra Nevada mountains in daylight.

The new train will be air-conditioned and will have modern conveniences. The equipment will include sleepers, both standard and tourist, and through reclining chair cars. Lounge-observation cars will be provided and the dining car service will be supplemented by "economy meals" served on trays to passengers in tourist cars and coaches. Porter service and pillows also will be provided for coach and chair-car passengers. The train will have a hostess-nurse whose special duty will be to render assistance to women and children traveling alone.

Allredge Gives Views on Inland Waterways

At a session of the Senate subcommittee on appropriations which was hearing testimony on the 1940 appropriation for the

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A Major Transportation Problem

Tennessee Valley Authority, J. Haden Allredge, who was recently nominated for a position on the Interstate Commerce Commission, gave his views on the effect of improvement of inland waterways on the railroads. Mr. Allredge told the committee that the inland waterway system was about 85 per cent completed.

Asked by Senator Townsend, Republican of Delaware, what the effect of this would be on the railroads, Mr. Allredge said that "If it functions efficiently and develops the great interior of this country, which its advocates expect it to do, it may conceivably increase the commerce sufficiently not to injure the railroads in the long run. A review of the past records of Congress on the subject of improvement of the inland rivers for navigation purposes discloses that one of the major objectives is and has been to balance, as far as possible, the economic conditions and opportunities of the interior country with the sections and regions situated along the deep-water margins which have the benefits of navigation on natural waterways, supplemented by harbor improvements and the construction of the Panama Canal."

Mr. Allredge also told the committee that there is a great deal of river traffic moving jointly between the rail lines and the water lines, and that in his opinion, the improved river system would never develop itself to its fullest usefulness until coordination between the river carriers and the rail carriers is worked out and effectuated.

"I think there is no question, but what if you were to judge the question from the standpoint of its immediate effect there would be some diminution of railroad tonnage by the navigation improvements all over the interior of the United States; but in the long run the result on traffic might be different," said Mr. Allredge. He closed his statement to the committee by observing that "If the commerce of the country does not grow as fast as it ought to without some very cheap means of transportation for a part of the commerce, then the river system has an important function to perform."

Runaway Locomotive Collides with Great Western Passenger Train

A runaway locomotive and one car collided head-on with a passenger train on the Chicago Great Western, 15 miles southwest of Harlan, Iowa, about 10 p. m., on February 19, killing two trainmen and injuring eleven passengers. The accident resulted from an unusual sequence of events which started during switching operations at Tennant, Iowa.

A westbound freight train had stopped at this point to pick up a car of corn. Train orders provided that the passenger train should wait at Magill until 10:15 p. m., and at Tennant until 10:25 p. m., for the freight train in order that it might have ample time to do the station switching and be in the clear by the time the passenger train was due. The engineman on the freight train headed into the siding, cut off the locomotive and backed in on the house track, from which he pulled forward a car of ties and the car of corn.

The car of corn was set on the siding, but failed to couple to the train. The

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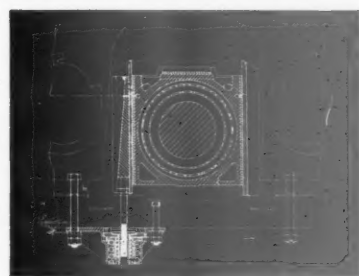


SUMMER LOCOMOTIVES must also be suitable for WINTER

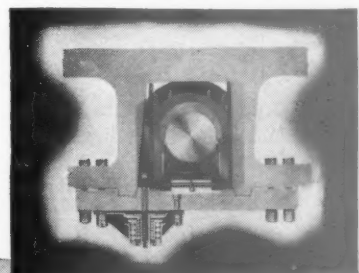
It is impossible to adjust wedges in the old way and care for the wide variations of temperature in the driving box. » » » The Franklin Automatic Compensator and Snubber does the job automatically with each turn of the wheel. It reduces maintenance, out-of-service time and makes the locomotive ride better. Include it in your specifications for new power whether plain or roller bearings are used and fix a program for home applications. » » » You CAN do something about the weather.



When maintenance is required a replacement part assumes importance equal to that of the device itself and should be purchased with equal care. Use only genuine Franklin repair parts in Franklin equipment.



ABOVE: Franklin Automatic Compensator and Snubber for Roller Bearing Driving Box application. BELOW: Franklin Automatic Compensator and Snubber for Friction Bearing Driving Box application.



FRANKLIN RAILWAY SUPPLY COMPANY, INC.

NEW YORK

CHICAGO

MONTREAL

brakeman failed to set the hand brake or block the car, with the result that while the locomotive was about to respot the car of ties on the house track, the car of corn started forward and struck it, breaking some steam pipes which filled the cab with steam. The fireman and engineman jumped to the ground, and it is believed that the engineman, in his haste, left the throttle in the open position so that the locomotive continued backing down the house track until it hit its own train, derailling four cars. In the collision, the locomotive reversed itself and proceeded from the house track onto the passing track, where it ran into the car of grain and pushed it out on the main line and down Tennant hill about four miles to a point one mile west of Magill. Since the freight train had not reached Magill at 10:15 p. m., the passenger train proceeded towards Tennant, and collided with the car of grain and the locomotive of the freight train.

The force of the impact turned the locomotive, demolished both locomotives, turned a mail storage car over on its side and derailed one truck of the baggage car, while other cars remained on the rails.

Czech Railways and Land "Appeasement"

The Munich agreement and subsequent international pacts by which Czechoslovakia surrendered land to Germany, Hungary and Poland has reduced the length of the lines operated or owned by the Czechoslovak State Railways from a total of 8,407 miles to 5,589 miles, a reduction of about 35 per cent. Of the lines ceded, 2,186 miles was surrendered to Germany, 651 miles to Hungary and 99 miles to Poland, the shares of the three countries being 26 per cent, 7.7 per cent and 1 per cent, respectively, of the total mileage of the former Czechoslovak system.

By provision of the four-power Munich agreement of September, 1938, Czechoslovakia was required not only to cede substantial parts of its mileage to Germany but as well to turn over equipment necessary for operation of the surrendered lines. After extensive negotiations Czechoslovakia finally turned over to the German State Railway a total of 888 locomotives, 2,160 passenger-train cars and 23,000 freight cars, or about 22 per cent of its total of 4,098 locomotives, 22 per cent of its 9,825 passenger-train cars, and 24 per cent of its 96,081 freight cars. The extent of rolling stock to be ceded to Hungary and Poland for use in their respective territories has not as yet been determined. To replace its surrendered rolling stock, and also for purposes of modernization, the Czechoslovakian Minister of Railways has recently asked home manufacturers for bids on 54 steam locomotives, 7 tenders, 22 rail motor-cars, 142 passenger-train cars and 200 box cars.

By reason of its surrender of territory, Czechoslovakia has lost through rail connections between many important cities. Thus it was necessary for the Czechoslovak State Railways to negotiate with the German State Railway to run through trains between Prague and Brno through several sections of new German territory.

It has been so arranged that these so-called "national" trains may pass through German territory without customs, passport and currency inspection, provided that German customs officials ride the train between the two Czechoslovakian frontier stations, no passengers are allowed to board or leave the train in German territory and freight is sealed. In order to do away with this awkward arrangement, however, the Minister of Railways plans to re-build a light-traffic, single-track line now in existence between Nemecky Brod, about 73 miles southeast of Prague, via Krizanov and Tisnov to Brno, in order to establish direct railway connections between Prague and the latter without crossing German territory. This section will be double-tracked and will constitute an extension of a new 56-mile, heavy-duty line between Prague and Nemecky Brod. It is expected that the entire project will be completed within two years.

Signaling Night at Western Railway Club

At the meeting of the Western Railway Club in Chicago on February 20, P. M. Gault, signal engineer of the Missouri Pacific, spoke on Speeding Up Train Operation With Signaling. The meeting was attended by 400 members and guests, including railroad officers from such remote points as Topeka, Kan., and San Francisco, Cal.

Since 1927, the Missouri Pacific has installed signaling on 1,570 miles of road, including 37 installations of remote control and centralized traffic control involving 375 miles of road. Mr. Gault, therefore, spoke from experience on his road, as well as from extensive studies of installations on other roads in America and in England. Mr. Gault emphasized that centralized traffic control, by means of which train movements are directed by signal indication without written orders, facilitates train movements by eliminating delays when meeting or passing trains. Passenger train performance is improved, and the average running time of freight trains is reduced more than one minute for each mile of territory so equipped. On account of the reduction in the number of stops, especially where grades are involved, the tonnage rating of freight locomotives can be increased. One installation on 42 miles of single track on the Missouri Pacific earns a return of 18 per cent on the total investment. A study of 25 C. T. C. installations on 18 roads, involving 453 miles of track, showed an average saving of 25 per cent on the investment, after deductions for maintenance and fixed charges. In addition, many of these C. T. C. installations effected more intensive utilization of existing facilities and equipment, and, in several cases, postponed the necessity for additional main tracks.

As explained by Mr. Gault, the installation of power switches and car retarders in gravity classification yards not only expedites operations, but also eliminates personal injury hazards. A study of 16 car retarder installations showed an average saving of 42 per cent. These savings were in part effected by handling certain switch-

ing in the car retarder yards that was formerly done at other yards. Operations can be improved and economies effected by consolidating the control of interlockings. One installation cited by Mr. Gault, now controls a territory that had previously been partially controlled by five interlockings, thus permitting the transfer of 33 men to other duties.

When discussing highway crossing protection, Mr. Gault explained the development of the standard flashing-light signaling and called attention to the more recently developed short-arm gate that is used as an adjunct to the flashing-light signal, especially at multiple-track crossings, as a means of preventing "second-train" accidents.

Thus modern signaling systems are contributing to the solution of many problems of increasing average train speeds with safety on a sound economic basis. Mr. Gault closed his paper with the thought that much more work of this nature must be done if we are to keep the railroads in the race.

Supply Trade

Lima Annual Report for 1938

The Lima Locomotive Works, Inc., in its annual report for the year ended December 31, 1938, declares a net loss for the year of \$687,035, compared with a net profit for 1937 of \$1,019,983. The earned surplus account at the end of the year showed an operating deficit of \$355,354.

The volume of sales billed during 1938 amounted to \$3,208,400, as compared with a volume of \$10,765,921 in the previous year. The works shipped ten locomotives during the year as contrasted with a total of 100 in 1937. In his report to stockholders, S. G. Allen, chairman of the board, declares that a general improvement in railroad traffic and operating income, which was perceptible in the third quarter of 1938, has not yet been sufficient to effect any marked increase in locomotive buying. He sees encouragement in this direction, however, warranted by a widely-accepted belief in the improvement of general business and the possibility of remedial legislation for the carriers.

Baldwin Locomotive Annual Report

The Baldwin Locomotive Works reports for the year ended December 31, 1938, a consolidated net loss after provision for depreciation and interest of \$1,032,641, compared with a consolidated net income of \$407,377 in 1937. Consolidated sales during the year totaled \$33,107,564, of which total, sales of locomotives and locomotive products comprised \$16,767,781. In 1937 consolidated sales totaled \$36,586,461, of which \$17,977,001 represented locomotive products. The sale of locomotives, it is to be noted, accounted for approximately half of the total sales volume in each of the last two years. In 1936 only 18 per cent of the total sales of the company were locomotive purchases. The company had \$13,401,321 of unfilled orders on hand at the close of 1938, of which \$1,278,018

NO. 33 OF A SERIES OF FAMOUS ARCHES OF THE WORLD



Photo by Fratelli Alinari—from "Bridges" by Charles S. Whitney—Published 1929 by William E. Rudge

PONS CESTIUS

(Ponte di S. Bartolommeo)

This semi-circular arch bridge, still standing in Rome, is distinctive because of its severity and massiveness. The spandrel walls are plain above the skillfully moulded arch ring or archivolt. The cut-waters at the end of the piers project out at a sharp angle and above them are strong square pillars which take the place of the niches found in some of the more beautiful Roman bridges.

The Security Sectional Arch, too, was designed primarily for utility. The basic design, developed by American Arch Company engineers 28 years ago is still used in modern locomotives. But, having a sectional arch is not enough; to realize true efficiency and to protect yourself against the waste caused by partially consumed fuel, make sure that each brick is in place before your locomotive leaves the roundhouse

THERE'S MORE TO SECURITY ARCHES THAN JUST BRICK

**HARBISON-WALKER
REFRACTORIES CO.**

Refractory Specialists



**AMERICAN ARCH CO.
INCORPORATED**

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*Locomotive Combustion
Specialists*

was for new locomotives. As of the end of 1937, total unfilled orders amounted to \$23,757,714, of which \$12,712,783 was for new locomotives.

During the year the Midvale Company, a partially-owned subsidiary, enjoyed a net profit of \$1,244,210, as compared with \$1,341,816 in 1937. The daily volume of business received during the year by the company exceeded that received in the preceding year and was the largest in any year since organization of the company in 1923. The volume of unfilled orders on hand at the end of 1938 amounted to \$7,689,387, as compared with \$6,200,548 at the end of 1937. The Baldwin Locomotive Works shared in the earnings of Midvale to the extent of \$765,353 during 1938, as compared with \$825,513 in 1937.

Charles E. Brinley, who was elected president of the company during the year, states categorically: "1938 was a poor business year." He then goes on to say that "inevitably the Baldwin Locomotive Works, which is a maker of durable goods and which normally finds its largest customer in the railroads, found its business seriously affected as a consequence of this situation. The fact that your company carried over into the production and into the sales of 1938 a considerable backlog of unfinished locomotives, the delivery of which was not wholly completed until past the middle of the year, beneficially influenced the results of the first six months. But a relatively low volume of sales from July to December, inclusive, necessitated heavy reductions in the working forces and called for a maximum of economy in all the processes of supervision and maintenance." As for the future it is his hope that 1939 will bring a considerable demand for new motive power. He indicates that orders from the carriers for maintenance and repair parts are improving at present and give some indication of the continuing upward trend.

The Insulite Company, Minneapolis, Minn., has completed the construction of a plant at South Kearny, N. J., for the manufacture and processing of insulated brick siding.

The H. K. Porter Company, Pittsburgh, Pa., has been reorganized by the bondholders and **T. M. Evans**, formerly associated with the Gulf Oil Corporation, has been elected president of the reorganized company.

Gilbert E. Webster, now associated with the St. Louis, Mo., agency of the **National Lock Washer Company**, has been appointed sales manager of its track spring washer department, with headquarters at Newark, N. J.

The Hunter Manufacturing Company has moved its office from 25 Broadway to 444 Madison avenue, New York City. The company has appointed as its distributors of the Rex Emergency Carbide Light, in the railroad industry, the following companies: The Rails Company, New York and New Haven, Conn., Lester T. Burwell, president; Industrial and Railroad Supply Company, 310 South Michigan boulevard, Chicago, H. A. Morean, manager of sales; The Railway

Equipment Company, 757 Paul Brown building, St. Louis, Mo., Richard E. Bell, president; Moffett & Romig, Hill building, Washington, D. C.

T. B. Clement has been appointed assistant to the president of the **Union Switch & Signal Company**, with headquarters at New York. Mr. Clement was born in Sunbury, Pa., and was graduated from Trinity College in 1917. In July of that year he entered the army as a second lieutenant and was assigned to the division staff headquarters of the 28th Division as



T. B. Clement

assistant division quartermaster. In March, 1918, he was promoted to first lieutenant, and in January, 1919, while in France, to a captain. After resigning from the army, he entered the employ of the International Mercantile Marine Company as assistant to the operations manager, with headquarters at Philadelphia, Pa. In 1921, he was transferred to the passenger department, where he remained until 1926 when he was promoted to manager of the company. In the fall of 1928, he resigned to become general traffic manager of Transcontinental Air Transport, Inc., with headquarters at St. Louis, Mo., and New York. Upon the formation of Transcontinental and Western Air, Inc., in 1930, he was elected vice-president of that company, in which position he remained until October 1, 1933, when he resigned to engage in private business at Philadelphia, Pa.

OBITUARY

H. J. L. Frank, president of the Bull Dog Electric Products Company, Detroit, Mich., died on February 14.

Construction

UNION PACIFIC.—A contract has been awarded the Sidles Company, Omaha, Neb., amounting to approximately \$8,350 for the installation of additional air-conditioning equipment in the general headquarters office building of the Union Pacific at Omaha, to provide winter circulation and humidification. The building has previously been equipped for summer air-conditioning.

Equipment and Supplies

Milwaukee To Spend \$11,000,000 for Improvements

The 1939 improvement budget of the Chicago, Milwaukee, St. Paul & Pacific involves a total expenditure of more than \$11,000,000. Major improvements include the renewal of the bridge across the Missouri River at Kansas City; the railroad company's proportion of the cost of reconstruction of the Mannheim road viaduct at Franklin Park, Ill., just west of Chicago; the construction of a twenty-car capacity building for handling fruit at St. Paul, Minn.; changes in the road's wheel foundry at Milwaukee, Wis.; and the improvement of its passenger station at Minneapolis, Minn. Rails and track fastenings and ballast involve an expenditure of \$3,700,000, and include the purchase and laying of 30,000 gross tons of new rails, the order for which was reported in the *Railway Age* of February 4. One thousand 50-ton all steel box cars and 75 steel caboose cars will be built in the company shops at Milwaukee. Six Diesel switching locomotives costing in excess of \$400,000 are to be acquired under a lease purchase plan. No new passenger cars will be built this year, the road having built more than 200 in the past five years, although a number of existing passenger cars will be air conditioned and remodeled.

LOCOMOTIVES

THE FORD MOTOR COMPANY has ordered three 1,000-hp. Diesel-electric locomotives from the General Electric Company, each locomotive to be equipped with two 500-hp. Cooper-Bessemer engines.

ROYAL STATE RAILWAYS OF SIAM.—Sealed tenders for the supply of Diesel-electric locomotives will be received by the superintendent of stores of this road, Bangkok, Siam, up to 14:00 o'clock, June 1. Blank tender forms are obtainable from Messrs. Sandberg, 25 Broadway, New York City.

PASSENGER CARS

THE MISSOURI PACIFIC is inquiring for two mail-storage cars, two mail-baggage, two coaches, two deluxe coaches, two diner-baggage-lounge and two parlor-observation cars.

FREIGHT CARS

THE MAINE CENTRAL is asking for prices on 750 freight cars, including 500 box cars of 40 tons' capacity, 150 twin hopper cars and 100 gondola cars.

THE UNITED STATES NAVY DEPARTMENT, BUREAU OF SUPPLIES AND ACCOUNTS has ordered two flat cars from the Magor Car Corporation. Inquiry for this equipment was reported in the *Railway Age* of November 19, page 758. Orders also have been placed for two box cars with the Greenville Steel Car Company and

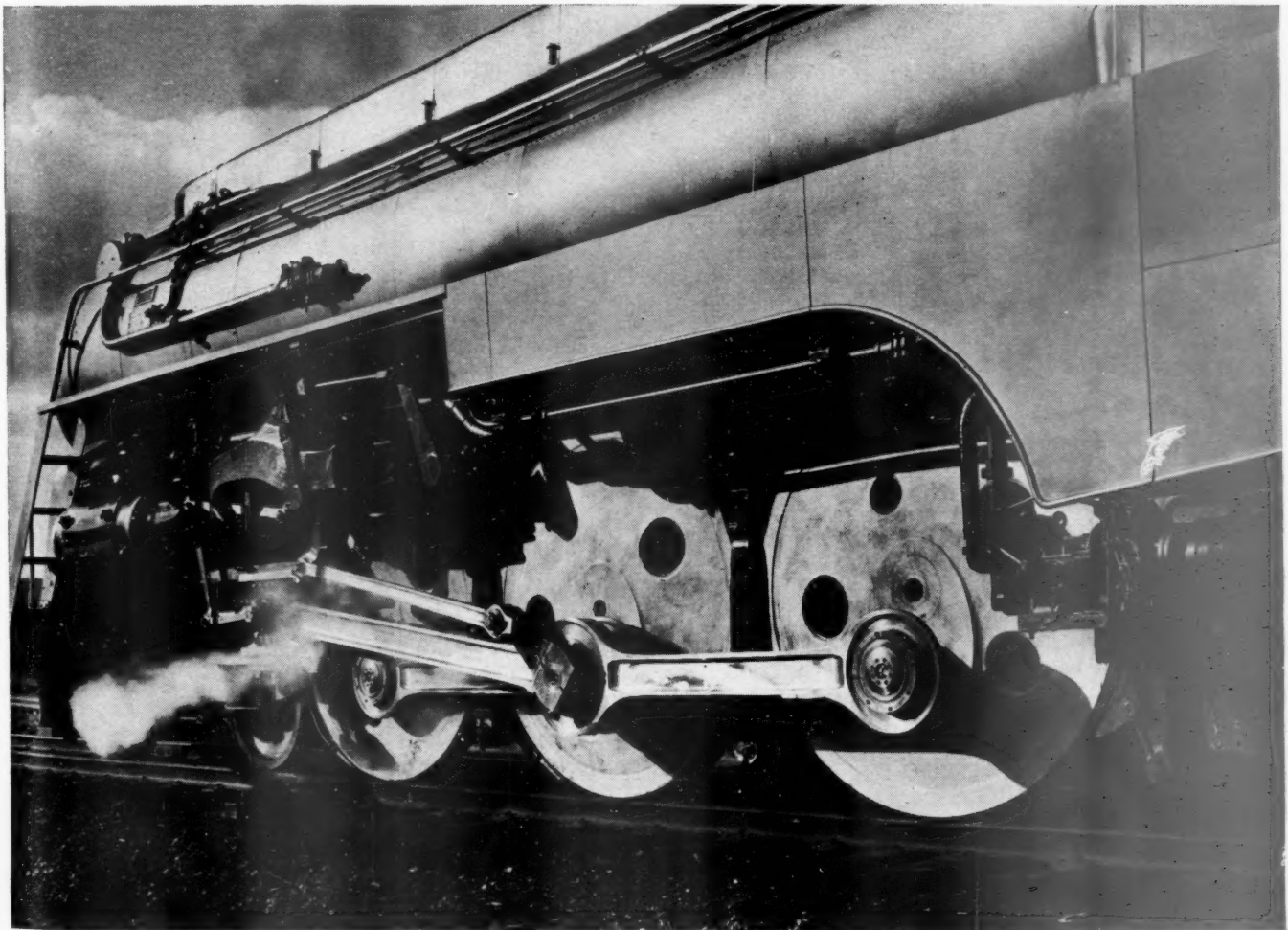
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"In the modern steam locomotive we have inner streamlining, giving better unobstructed steam circulation, resulting in lower drops in steam pressures and lower steam consumption, thus increasing the locomotive power."

—Wm. C. Dickerman, President
American Locomotive Company

Elesco superheater units are streamlined internally and externally to give better unobstructed steam circulation and gas passage . . . there is no omission of the streamlining at the return bends, as they are not commercial bends welded onto the pipes—they are formed by machine-die-forging the ends of the tubing.

Keep abreast of superheater development with Elesco.



A Robert Yarnall Ritchie Photograph



THE SUPERHEATER COMPANY

Representative of AMERICAN THROTTLE COMPANY, INC.

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Superheaters * Exhaust Steam Injectors * Feed Water Heaters * American Throttles * Pyrometers * Steam Dryers

inquiries are now being made for two steel box cars and two steel flat cars, all of 50-tons' capacity.

IRON AND STEEL

THE NEW YORK CENTRAL is asking for bids until March 3 for its requirements of rail and track fastenings.

THE CHICAGO & EASTERN ILLINOIS has ordered 5,000 tons of rails, placing 1,250 tons with the Inland Steel Company, and 3,250 tons with the Carnegie-Illinois Steel Corporation. The order may be increased to 10,000 tons later.

THE SOUTHERN PACIFIC has ordered 12,440 tons of rail accessories from the Bethlehem Steel Company, the Colorado Fuel & Iron Corporation, the Columbia Steel Company, the Rail Joint Company, the Pettibone Mulliken Corporation, the National Lock Washer Company and the Ramapo Ajax Division of the American Brake Shoe & Foundry Company.

Financial

MISSOURI PACIFIC.—Date Set for Oral Argument.—The Interstate Commerce Commission, Division 4, has set March 22 as the date for oral argument in this company's reorganization case under Section 77 of the Bankruptcy Act.

PENNSYLVANIA.—Annual Report.—This company, in its annual report for 1938; showed net income surplus (after appropriations to sinking and other funds) of \$3,010,781, which was a decrease of \$16,123,391 under 1937. The income account, in abbreviated form, follows:

	1938	Comparison with 1937
Operating revenues.....	\$360,384,241	* \$95,549,267
Operating expenses.....	257,047,243	* 80,914,050
Net revenue.....	103,336,998	* 14,635,217
Taxes, hire of equipment and joint facility rents.....	46,004,100	† 1,032,812
Net railway operating income.....	57,332,898	* 15,668,029
Non-operating income.....	36,226,180	* 1,333,047
Gross income.....	93,559,078	* 17,001,076
Fixed charges.....	82,512,978	* 768,538
Net income.....	11,046,100	* 16,232,538
Appropriations to sinking and other funds, etc.....	8,035,319	* 109,147
Surplus.....	3,010,781	* 16,123,391

* Decrease.
† Increase.

Average Prices of Stocks and Bonds

	Feb. 21	Last week	Last year
Average price of 20 representative railway stocks..	30.35	30.38	31.19
Average price of 20 representative railway bonds..	61.10	61.35	63.91

Dividends Declared

Alabama & Vicksburg.—Capital, 3 per cent, semi-annually, payable April 1 to holders of record March 8.

Pullman, Inc.—25c, payable March 15 to holders of record February 24.

Vicksburg, Shreveport & Pacific.—Preferred, 2½ per cent, semi-annually; Common, 2½ per cent, semi-annually, both payable April 1 to holders of record March 8.

Railway Officers

FINANCIAL, LEGAL AND ACCOUNTING

E. O. Moore has been appointed freight claim agent of the Wichita Falls & Southern, with headquarters at Wichita Falls, Tex.

Richard J. Wagner, special accountant on the Louisville & Nashville, has been promoted to assistant to the comptroller, a newly-created position, with headquarters at Louisville, Ky.

P. S. Chalmers, treasurer of the Northern Alberta Railways, with headquarters at Edmonton, Alta., has been appointed regional treasurer of the Canadian National, at Winnipeg, Man., to succeed **P. J. Farley**, who has retired under the company's pension plan after many years of service. **T. H. Best**, assistant treasurer, telegraphs and telephones of the Canadian National at Toronto, Ont., has been appointed paymaster there, succeeding **A. R. Curran**, who has been appointed treasurer of the Northern Alberta Railways at Edmonton, to succeed Mr. Chalmers. **H. P. Howells**, chief clerk and cashier at Montreal, has been appointed assistant treasurer, telegraphs and telephones at Toronto, to succeed Mr. Best.

Mr. Farley joined the service of the Canadian National as roadmaster's clerk at Winnipeg in 1900. He advanced through various positions in the paymaster's office, becoming general paymaster in 1920, assistant treasurer, Western region, in 1933 and treasurer of that region at Winnipeg in 1932.

OPERATING

F. B. Leonard, chief dispatcher on the Chicago, Burlington & Quincy at Ottumwa, Iowa, has been promoted to train rules examiner, with headquarters at Chicago.

F. C. Brumleve, freight agent on the Pennsylvania at Logansport, Ind., has been appointed supervising agent-freight agent of the Logansport division, with the same headquarters.

Harry M. Eicholtz, acting general manager of the Chicago & North Western, with headquarters at Chicago, has been appointed general manager, a position that has been vacant since the retirement on July 1, 1937, of **G. B. Vilas**. Mr. Eicholtz was born in Lee County, Ill., on February 18, 1873, and entered railway service on August 3, 1890, as a station baggageman on the North Western at Nachusa, Ill. In August, 1891, he was appointed a telegraph operator, in September, 1897, a train dispatcher and in August, 1906, a trainmaster. In March, 1909, he was promoted to assistant superintendent, which position he held until April, 1912, when he was promoted to superintendent. Mr. Eicholtz was advanced to assistant general superintendent in October, 1917,

and in March, 1920, he was promoted to assistant to the vice-president in charge of operations. In January, 1925, he was pro-



Moffett

Harry M. Eicholtz

moted to assistant general manager and on July 1, 1937, he was advanced to acting general manager.

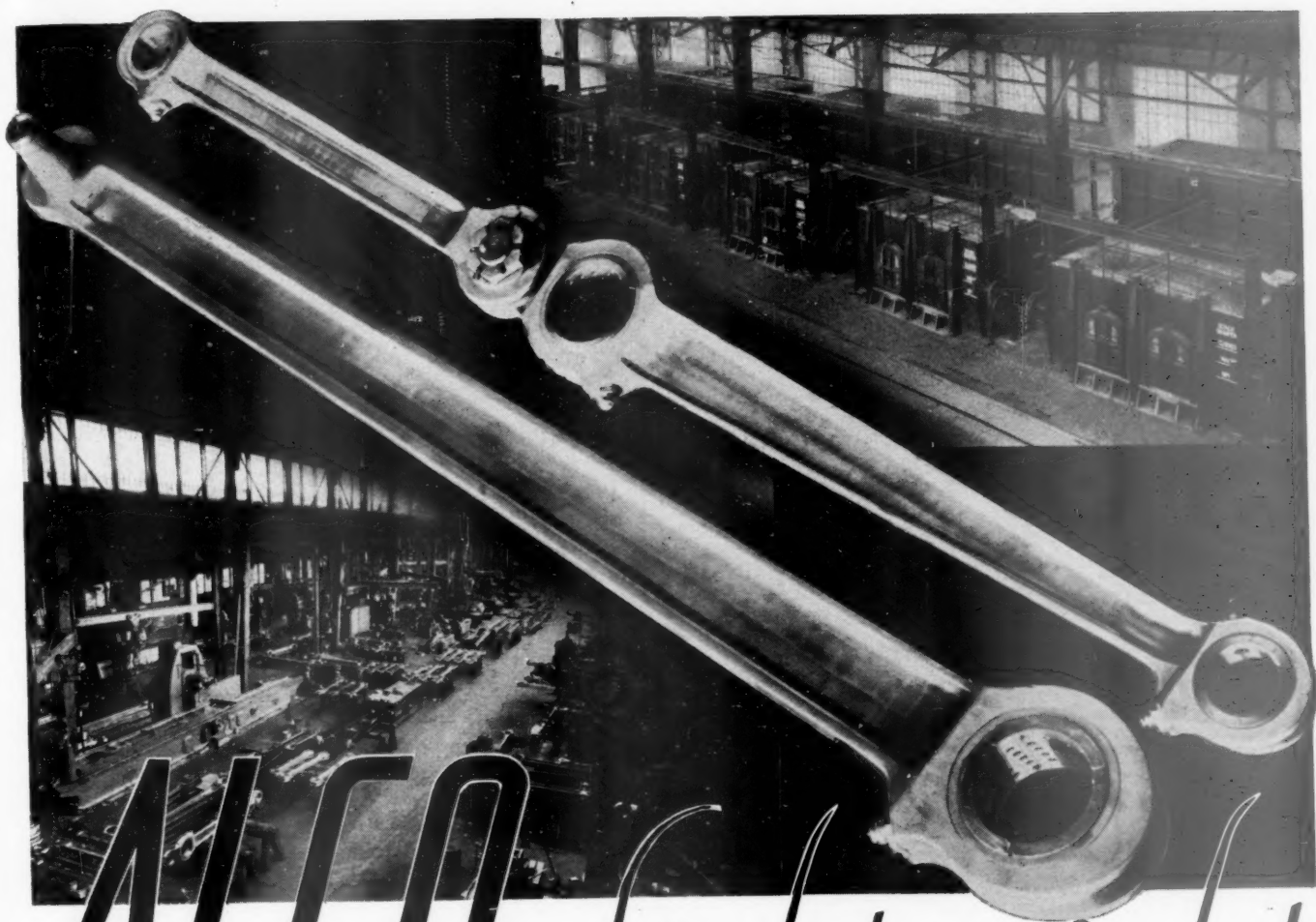
Oliver Harold Carper, whose appointment as superintendent freight transportation of the Chesapeake & Ohio at Richmond, Va., was noted in the *Railway Age* of February 11, was born on February 23, 1887, at Grandview, W. Va. He attended the public schools of Raleigh County, W. Va., was graduated from Massey Business College, Richmond, and studied railroad engineering with the International Correspondence School. Mr. Carper entered railroad service in May, 1910, as stenographer with the Chesapeake & Ohio, prior to which he worked in the coal mines of West Virginia as miner, trackman, contractor and was with the Boxley Brothers in railroad construction. He resigned from the Chesapeake & Ohio in 1911 to go with the Insurance department of the Virginia Carolina Chemical Company at Richmond. In August, 1912, Mr. Carper returned to the C. & O. as stenographer-clerk, car service agent's office, Richmond. In January, 1913, he was appointed clerk, superin-



O. H. Carper

tendent passenger transportation; in June, 1916, stenographer in the office of the general manager; in January, 1917, file clerk,

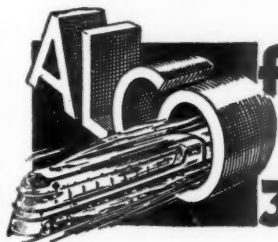
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LIGHT-WEIGHT alloy steel forgings for modern locomotives demand far more than correct engineering design. Engineering ability of the highest calibre must be available, of course; but, unless manufacturing facilities are thoroughly modern, and unless smith shop personnel is specially competent and experienced in this particular class of work—is it possible to compete with ALCO either as to forging quality or price?

ALCO has spared no expense equipping its forging department with ultra-modern, smith shop machinery and with the very latest heat-treating facilities for the scientific production of light-weight, locomotive forgings. Also, ALCO metallurgists, engineers and smith shop experts have had wide experience in locomotive forging manufacture over an extended period of years. Having the added advantage of ALCO's unsurpassed facilities, these men are prepared *in every respect* to meet your locomotive forging requirements with the utmost satisfaction as to quality and price.



AMERICAN LOCOMOTIVE COMPANY

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same office, and in July, 1917, secretary to general manager. He was appointed chief clerk to superintendent freight transportation at Cincinnati, Ohio, in March, 1918, and in September of that year became chief clerk to superintendent transportation at Richmond. In October, 1926, Mr. Carper became chief clerk to general superintendent transportation at Richmond. On January 1, 1929, he was promoted to assistant to general superintendent transportation, which position he held until his recent promotion to superintendent freight transportation.

TRAFFIC

D. J. Hearne, office manager for the vice-president in charge of traffic of the Illinois Central, has been promoted to assistant general passenger agent, with headquarters at Chicago, succeeding to a position that has been vacant since the retirement of **Homer S. Gray** on May 1, 1938.

James C. Beene, general freight agent of the Pennsylvania-Reading Seashore Lines, with headquarters at Camden, N. J., has been appointed assistant general freight agent of the Reading, with headquarters at Philadelphia, Pa., succeeding **B. M. Croll**, who has been appointed assistant freight traffic manager. **J. Warren Lawson**, industrial agent, Reading Company, has been appointed general freight agent of the Pennsylvania-Reading Seashore Lines, succeeding Mr. Beene. **Harold A. J. Kenney**, traveling freight agent, Reading Company, succeeds Mr. Lawson as industrial agent.

Thomas M. Hayes, acting passenger traffic manager of the Wabash, with headquarters at St. Louis, Mo., has been appointed passenger traffic manager. Mr. Hayes was born at Morrisonville, Ill., and, after a public school and business college



Thomas M. Hayes

education, entered railway service in 1903 as a trackman on the Wabash. Two years later he became a clerk to a track supervisor, later being assigned to the position of stenographer in the division engineer's office. In 1909 Mr. Hayes was advanced to traveling secretary to the president, serving in this position until 1924, when he was made assistant to the president. In

1931, when the Wabash was placed in receivership, Mr. Hayes' title was changed to assistant to the receiver. Two years later he was appointed assistant general manager and on August 1, 1936, he was appointed assistant passenger traffic manager. On September 1, 1938, he was promoted to acting passenger traffic manager.

ENGINEERING AND SIGNALING

George W. Corrigan, former division engineer of the Los Angeles division of the Southern Pacific, who has been on a leave of absence for some time, retired on January 1, because of ill health.

H. C. Hayes, assistant engineer on the Illinois division of the Illinois Central at Champaign, Ill., has been appointed acting division engineer of that division, replacing **C. J. Harrington** who has taken a leave of absence because of illness.

Timothy G. Sughrue, division engineer of the Boston & Maine at Boston, Mass., who has been appointed engineer maintenance of way of the Maine Central and the Portland terminal, as noted in the *Railway Age* of February 4, has been identified with the Boston & Maine continuously for nearly 30 years. He was born on February 22, 1889, at Nashua, N. H., and was educated at the University of New Hampshire. During summer vacation periods while he was in college Mr. Sughrue served with the B. & M. as a clerk in the operating department and as a section laborer. On August 2, 1909, he entered the service of this company permanently, serving as office assistant to the chief engineer and division engineer until June, 1914, when he was advanced to assistant supervisor of bridges and buildings at Nashua. Three years later, Mr. Sughrue was promoted to supervisor of bridges and buildings, with the same headquarters, being transferred to Salem, Mass., in 1925. Two years later, he was promoted to division engineer of the Portland division, with headquarters at Salem, being in 1929 transferred to the Terminal division at Boston. He continued to hold the latter position until his recent appointment as engineer maintenance of way of the Maine Central and the Portland terminal, with headquarters at Portland, Me.

MECHANICAL

Orlin H. Clark, supervisor of car repair bills on the Missouri Pacific, with headquarters at Houston, Tex., has been promoted to general car inspector, with the same headquarters.

OBITUARY

Robert J. Clancy, who retired in January, 1932, as assistant to the general manager of the Southern Pacific, Pacific Lines, with headquarters at San Francisco, Cal., died at that point on February 20.

William H. Sellew, who retired as assistant valuation engineer of the Michigan Central, with headquarters at Detroit, Mich., on August 31, 1927, died on January 29 at Ann Arbor, Mich.

John F. Vallery, who retired in September, 1934, as assistant general freight agent on the Chicago, Burlington & Quincy, with headquarters at Denver, Colo., died of pneumonia at that point on February 22.

Thomas Benton Hamilton, who retired as vice-president on the Pennsylvania, with headquarters at Chicago, on May 1, 1932, died at Culver, Ind., on February 18, as the result of a cerebral hemorrhage. Mr. Hamilton was born in Columbus, Ohio, on August 7, 1865, and graduated



Thomas Benton Hamilton

from Princeton University in 1888. He entered railway service with the Pennsylvania in November, 1888, as a rodman on the Louisville division. In 1890, he was transferred to the Pittsburgh division as assistant on the engineering corps and on January 1, 1896, he was promoted to assistant engineer. In May, 1897, he was advanced to engineer of maintenance of way of the Toledo division, later being transferred to the Cincinnati and to the Cleveland and Pittsburgh divisions. On June 1, 1901, he was promoted to superintendent of the Erie and Ashtabula division and on December 21, 1903, he was transferred to the Cleveland and Pittsburgh division. Mr. Hamilton was advanced to general superintendent of the Central system in 1912, and two years later he was appointed general manager of the Vandalia (now part of the Pennsylvania). In 1917 he was appointed resident vice-president for the Pennsylvania, Lines West of Pittsburgh, with headquarters at St. Louis, Mo., and in 1918, he was appointed general superintendent of the St. Louis system. Upon the termination of federal control of the railroads, he was appointed general manager of the Northwestern region, with headquarters at Chicago. In 1924, he was advanced to regional vice-president and general manager, with jurisdiction over the same territory. A year later he was appointed to the same position on the Western region, with headquarters as before at Chicago, which position he held until 1926, when he was elected vice-president of the Western region in charge of all departments. In 1929, Mr. Hamilton was assigned to the direction of matters of general interest and policy, retaining the title of vice-president until his retirement on May 2, 1932.

Operating Revenues and Operating Expenses of Class I Steam Railways

Compiled from 137 Monthly Reports of Revenues and Expenses Representing 141 Class I Steam Railways

(Switching and Terminal Companies Not Included)

FOR THE MONTH OF DECEMBER, 1938 AND 1937


Item	United States		Eastern District		Southern District		Western District	
	1938	1937	1938	1937	1938	1937	1938	1937
Miles of road operated at close of month.....	233,890	235,052	57,694	58,090	44,540	44,744	131,656	132,218
Revenues:								
Freight	\$251,320,071	\$231,342,936	\$104,037,896	\$93,316,967	\$52,110,226	\$47,978,926	\$95,171,949	\$90,047,043
Passenger	37,913,317	39,933,069	21,436,022	21,617,469	5,080,065	5,723,360	11,397,230	12,592,240
Mail	10,601,331	10,403,897	3,986,227	3,911,546	1,743,463	1,723,938	4,871,641	4,768,413
Express	5,152,382	4,732,199	1,722,584	1,694,980	1,351,651	948,223	2,078,147	2,088,996
All other operating revenues	13,349,153	13,908,721	6,621,771	6,999,210	1,818,012	1,859,804	4,909,370	5,049,707
Railway operating revenues	318,336,254	300,320,822	137,804,500	127,540,172	62,103,417	58,234,251	118,428,337	114,546,399
Expenses:								
Maintenance of way and structures	31,370,873	33,420,280	12,401,429	13,940,133	5,792,337	6,038,609	13,177,107	13,441,538
Maintenance of equipment	60,340,136	60,787,338	26,917,931	27,897,082	11,281,643	10,960,603	22,140,562	21,929,653
Traffic	8,742,742	9,129,394	3,122,916	3,285,263	1,740,172	1,780,398	3,879,654	4,063,733
Transportation—Rail line..	118,620,273	125,289,768	53,553,115	55,729,083	20,131,264	20,803,665	44,935,894	48,757,020
Transportation—Water line	402,555	429,162	.....	.....	.....	.....	402,555	429,162
Miscellaneous operations...	3,180,864	3,530,063	1,448,998	1,634,871	410,521	435,302	1,321,345	1,459,890
General	10,612,346	11,344,891	4,306,715	4,449,810	2,043,053	2,155,746	4,262,578	4,739,335
Transportation for investment—Cr.	565,931	576,195	204,250	212,266	32,688	84,113	328,993	279,816
Railway operating expenses	232,703,858	243,354,701	101,546,854	106,723,976	41,366,302	42,090,210	89,790,702	94,540,515
Net revenue from railway operations	85,632,396	56,966,121	36,257,646	20,816,196	20,737,115	16,144,041	28,637,635	20,005,884
Railway tax accruals.....	26,616,044	21,061,046	11,251,735	8,940,553	6,092,183	3,220,874	9,272,126	8,899,619
Railway operating income	59,016,352	35,905,075	25,005,911	11,875,643	14,644,932	12,923,167	19,365,509	11,106,265
Equipment rents—Dr. balance	7,322,190	7,405,032	3,556,447	3,172,575	364,275	420,065	3,401,468	3,812,392
Joint facility rent—Dr. balance	2,320,985	2,505,186	1,236,816	1,281,649	301,965	374,213	782,204	849,324
Net railway operating income	49,373,177	25,994,857	20,212,648	7,421,419	13,978,692	12,128,889	15,181,837	6,444,549
Ratio of expenses to revenues (per cent)	73.1	81.0	73.7	83.7	66.6	72.3	75.8	82.5
Depreciation included in operating expenses.....	16,563,469	16,841,606	7,086,338	7,557,070	3,206,292	3,192,444	6,270,839	6,092,092
Pay roll taxes.....	8,404,644	4,747,389	3,555,515	1,142,857	1,520,488	999,233	3,328,641	2,605,299
All other taxes.....	18,211,400	16,313,657	7,696,220	7,797,696	4,571,695	2,221,641	5,943,485	6,294,320

FOR TWELVE MONTHS ENDED WITH DECEMBER, 1938 AND 1937

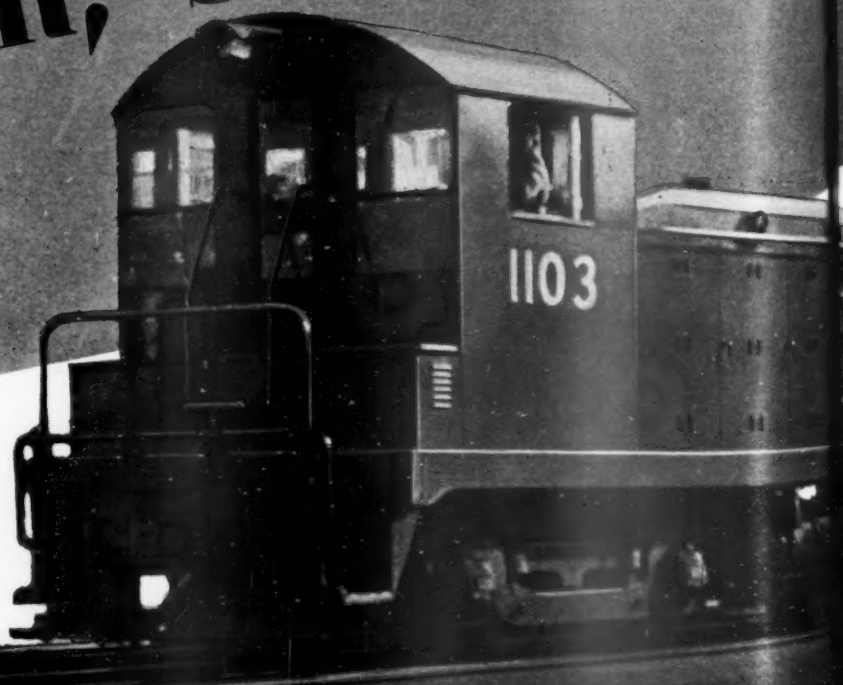
Miles of road operated at close of month*.....	234,483	235,511	57,907	58,262	44,656	44,788	131,920	132,461
Revenues:								
Freight	\$2,858,077,292	\$3,378,108,652	\$1,119,730,484	\$1,413,212,562	\$581,449,116	\$654,327,479	\$1,156,897,692	\$1,310,568,611
Passenger	405,883,261	442,809,304	224,193,429	243,424,820	53,216,778	60,943,012	128,473,054	138,441,472
Mail	95,963,350	97,983,881	36,573,287	37,418,329	16,623,356	17,056,094	42,766,707	43,509,458
Express	48,461,711	57,682,929	17,643,969	23,519,887	10,202,510	11,731,621	20,615,232	22,431,421
All other operating revenues	157,105,269	189,483,835	76,697,766	95,098,870	20,375,608	23,525,733	60,031,895	70,859,232
Railway operating revenues	3,565,490,883	4,166,068,601	1,474,838,935	1,812,674,468	681,867,368	767,583,939	1,408,784,580	1,585,810,194
Expenses:								
Maintenance of way and structures	420,162,535	495,593,910	153,419,401	195,661,188	76,488,714	85,688,183	190,254,420	214,244,539
Maintenance of equipment	676,518,731	826,708,829	282,462,402	374,117,550	131,039,049	149,647,521	263,017,280	302,943,758
Traffic	102,529,616	105,478,227	37,244,996	38,783,191	19,516,428	19,853,350	45,768,192	46,841,686
Transportation—Rail line..	1,356,815,562	1,504,642,207	596,357,540	676,732,431	228,735,676	245,644,854	531,722,346	582,264,922
Transportation—Water line	4,717,281	5,632,784	.....	.....	.....	.....	4,717,281	5,632,784
Miscellaneous operations...	37,502,275	41,285,649	16,571,501	18,430,586	4,438,797	4,941,385	16,491,977	17,913,678
General	127,522,868	145,344,848	50,706,365	60,129,566	24,262,197	26,595,917	52,554,306	58,619,365
Transportation for investment—Cr.	3,540,102	5,621,522	760,200	1,095,188	511,560	782,224	2,268,342	3,744,110
Railway operating expenses	2,722,228,766	3,119,064,932	1,136,002,005	1,362,759,324	483,969,301	531,588,986	1,102,257,460	1,224,716,622
Net revenue from railway operations	843,262,117	1,047,003,669	338,836,930	449,915,144	197,898,067	235,994,953	306,527,120	361,093,572
Railway tax accruals.....	340,779,786	325,665,199	143,600,346	143,457,462	69,257,335	68,229,161	127,916,105	113,978,576
Railway operating income	502,482,331	721,338,470	195,230,584	306,457,682	128,640,732	167,765,792	178,611,015	247,114,996
Equipment rents—Dr. balance	94,964,906	95,020,922	40,688,567	39,326,088	5,327,517	3,783,333	48,948,822	51,911,501
Joint facility rent—Dr. balance	34,671,111	36,113,652	18,635,557	19,937,641	3,887,789	3,953,740	12,147,765	12,222,271
Net railway operating income	372,846,314	590,203,896	135,906,460	247,193,953	119,425,426	160,028,719	117,514,428	182,981,224
Ratio of expenses to revenues (per cent)	76.3	74.9	77.0	75.2	71.0	69.3	78.2	77.2
Depreciation included in operating expenses.....	201,825,146	197,033,671	87,984,161	87,398,751	39,403,881	37,682,515	74,437,104	71,952,405
Pay roll taxes.....	99,168,064	64,972,738	41,569,414	34,001,636	17,642,629	11,079,496	39,956,021	19,891,606
All other taxes.....	241,611,722	260,692,461	102,036,932	109,455,826	51,614,706	57,149,665	87,960,084	94,086,970


* Represents an average of the mileage reported at the close of each month within the period.
Compiled by the Bureau of Statistics, Interstate Commerce Commission. Subject to revision.

Table of Freight Operating Statistics
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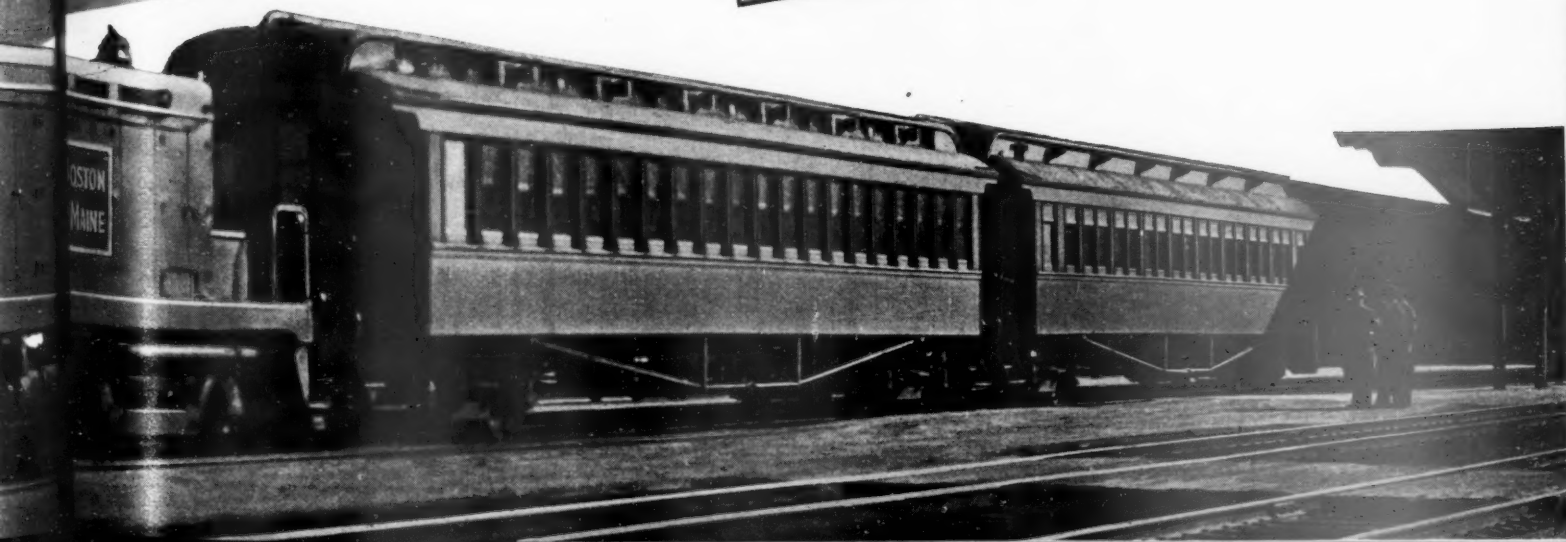


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OF SAFER, CLEANER,
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Freight Operating Statistics of Large Steam Railways—Selected Items for the Month of December,

Region, road, and year	Miles of road operated	Train-miles	Locomotive-miles		Car-miles		Ton-miles (thousands)		Number of road locomotives on line					
			Principal and helper	Light	Loaded (thousands)	Per cent loaded	Gross, excluding locomotives and tenders	Net, revenue and non-revenue	Serviceable		Un-serviceable	Per cent un-serviceable		
									Not stored	Stored				
New England Region:														
Boston & Albany.....1938	374	141,285	146,647	10,328	2,804	63.1	163,419	55,129	56	..	34	37.8		
1937	374	127,850	132,291	8,533	2,537	63.8	146,163	48,553	57	6	28	30.8		
Boston & Maine.....1938	1,937	268,124	297,486	24,235	8,513	65.5	498,209	184,274	140	..	99	41.4		
1937	1,941	253,067	277,224	21,756	8,173	66.2	468,016	168,136	123	5	116	47.5		
N. Y., New Hav. & Hartf..1938	1,856	334,834	420,565	29,582	10,966	62.9	629,311	228,631	174	4	90	36.1		
1937	1,983	313,615	389,037	26,589	9,725	62.7	550,123	196,503	171	30	65	25.2		
Great Lakes Region:														
Delaware & Hudson.....1938	830	213,899	291,272	33,389	7,374	61.9	477,604	227,258	130	89	42	16.1		
1937	830	225,018	296,648	31,183	7,169	59.6	469,095	214,701	119	112	26	10.1		
Del., Lack. & Western.....1938	983	349,381	392,003	54,853	11,752	64.8	709,136	273,958	122	4	83	39.7		
1937	983	357,481	397,625	53,872	10,926	63.2	669,459	256,349	131	8	83	37.4		
Erie (incl. Chi. & Erie).....1938	2,290	615,163	654,862	38,266	25,786	64.2	1,594,255	612,271	217	24	232	49.0		
1937	2,275	633,319	669,988	39,681	25,680	62.3	1,598,773	595,934	240	37	196	41.4		
Grand Trunk Western.....1938	1,027	248,618	251,443	1,785	6,437	60.2	404,779	138,669	69	..	46	40.0		
1937	1,027	248,109	252,449	3,026	6,004	59.1	380,975	130,761	77	..	44	36.4		
Lehigh Valley .....1938	1,248	317,254	353,879	56,106	12,279	62.7	790,046	325,220	120	1	119	49.6		
1937	1,289	328,796	360,042	47,103	12,053	62.6	780,134	322,355	132	7	131	48.5		
New York Central.....1938	10,651	2,644,217	2,783,954	172,527	83,297	57.3	5,755,521	2,314,947	913	105	454	30.8		
1937	10,649	2,635,315	2,792,142	158,932	80,537	57.1	5,573,957	2,232,096	921	216	339	23.0		
N. Y., Chicago & St. Louis.1938	1,672	491,469	498,333	6,353	16,732	61.5	1,048,309	389,188	156	8	34	17.2		
1937	1,672	476,786	485,875	6,810	15,421	60.3	970,180	351,892	156	18	20	10.3		
Pere Marquette .....1938	2,081	330,757	336,464	6,537	8,573	59.7	558,902	206,876	104	2	54	33.8		
1937	2,081	342,301	346,686	6,244	8,710	57.9	575,409	204,744	107	16	39	24.1		
Pittsburgh & Lake Erie....1938	233	65,572	67,731	64	2,321	55.7	199,359	104,596	25	8	38	53.5		
1937	234	52,333	53,624	30	2,059	57.6	173,330	92,304	25	23	23	32.4		
Wabash .....1938	2,397	557,106	569,935	12,287	16,951	63.7	1,023,195	360,897	137	6	131	47.8		
1937	2,421	570,033	580,953	11,526	16,579	61.4	1,025,406	357,361	146	21	123	42.4		
Central Eastern Region:														
Baltimore & Ohio.....1938	6,285	1,315,548	1,607,859	174,336	38,530	60.5	2,709,394	1,194,379	611	159	475	38.2		
1937	6,326	1,352,054	1,658,813	173,667	36,734	58.7	2,601,408	1,132,509	711	94	488	37.7		
Central of New Jersey.....1938	681	151,305	172,235	35,700	4,731	58.9	340,123	161,439	69	4	77	51.3		
1937	678	154,269	173,593	34,307	4,679	57.5	341,758	161,263	82	6	68	43.6		
Chicago & Eastern Illinois.1938	927	181,941	182,183	3,081	4,317	62.1	285,316	119,967	54	..	40	42.6		
1937	927	179,535	180,358	2,982	4,201	60.0	291,126	125,351	55	..	49	47.1		
Elgin, Joliet & Eastern.....1938	390	96,153	97,392	1,089	2,228	57.0	178,060	85,743	54	1	26	32.1		
1937	435	90,601	92,373	1,405	1,880	56.2	150,600	71,526	55	3	25	30.1		
Long Island .....1938	379	28,807	29,794	16,740	265	50.2	21,034	8,169	37	6	5	10.4		
1937	390	31,726	31,884	15,856	266	49.8	21,270	8,179	36	8	5	10.2		
Pennsylvania System .....1938	9,995	2,572,170	3,089,102	351,368	92,162	59.2	6,430,857	2,753,788	1,192	96	1,049	44.9		
1937	10,008	2,605,704	3,029,113	340,325	87,901	59.1	6,096,047	2,623,519	1,212	465	636	27.5		
Reading .....1938	1,442	396,882	441,684	55,234	11,072	58.5	849,430	410,510	173	10	163	47.1		
1937	1,445	410,456	451,234	50,538	10,421	57.0	806,982	381,920	208	19	103	31.2		
Pocahontas Region:														
Chesapeake & Ohio.....1938	3,057	769,972	807,435	34,851	31,276	54.9	2,657,157	1,422,507	373	47	115	21.5		
1937	3,049	789,515	828,281	34,780	30,606	54.3	2,603,957	1,390,680	388	68	96	17.4		
Norfolk & Western.....1938	2,169	631,399	662,365	40,361	25,457	58.5	2,073,647	1,087,774	277	54	28	7.8		
1937	2,178	607,975	631,360	35,247	22,510	58.0	1,829,283	964,969	297	46	21	5.8		
Southern Region:														
Atlantic Coast Line.....1938	5,082	641,953	644,349	8,873	12,907	56.1	799,638	249,137	235	20	106	29.4		
1937	5,079	603,939	607,150	8,243	12,880	58.8	743,797	254,909	231	21	107	29.8		
Central of Georgia.....1938	1,838	243,912	245,258	3,319	4,920	67.4	287,068	108,113	90	1	33	26.6		
1937	1,886	232,558	233,833	3,223	4,489	64.8	268,372	100,737	103	..	20	16.3		
Illinois Central (incl. Y. & M. V.).....1938	6,537	1,309,344	1,316,332	24,855	34,961	59.1	2,374,288	976,345	593	11	209	25.7		
1937	6,541	1,465,884	1,480,809	28,682	35,846	57.1	2,540,362	1,054,002	654	22	177	20.8		
Louisville & Nashville.....1938	4,916	1,049,908	1,123,997	29,324	24,405	58.3	1,747,530	813,392	328	6	203	37.8		
1937	4,928	1,105,951	1,179,425	33,301	22,792	57.3	1,666,346	788,076	379	23	153	27.6		
Seaboard Air Line.....1938	4,305	554,082	575,515	3,597	13,507	61.8	826,066	297,242	233	10	62	20.3		
1937	4,305	519,250	534,199	4,708	12,855	61.8	789,616	286,611	228	17	58	19.1		
Southern .....1938	6,556	1,294,250	1,312,490	20,516	27,617	62.9	1,672,951	649,655	478	12	209	29.9		
1937	6,570	1,202,476	1,218,014	17,560	24,192	61.2	1,479,148	585,094	501	2	233	31.7		
Northwestern Region:														
Chicago & North Western..1938	8,380	817,154	840,820	19,392	22,189	60.4	1,437,072	532,495	302	148	250	35.7		
1937	8,388	919,464	950,895	24,723	22,653	59.0	1,495,961	543,720	347	157	197	28.1		
Chicago Great Western.....1938	1,450	268,157	269,705	6,291	7,213	58.2	470,456	160,064	64	..	26	28.9		
1937	1,450	283,616	286,240	8,767	7,385	60.3	463,426	165,594	67	..	27	28.7		
Chi., Milw., St. P. & Pac..1938	10,934	1,207,840	1,241,128	39,809	31,278	59.2	2,076,751	819,846	424	120	142	20.7		
1937	11,017	1,242,076	1,292,367	52,238	30,388	59.4	2,016,109	803,875	488	71	130	18.9		
Chi., St. P., Minneap. & Om..1938	1,619	215,447	224,338	10,779	4,513	62.4	289,710	114,082	112	10	17	12.2		
1937	1,636	228,781	237,256	12,508	4,899	62.1	319,249	133,649	113	10	18	12.8		
Great Northern .....1938	7,976	729,311	724,459	27,849	22,092	62.0	1,457,010	570,140	330	73	143	26.2		
1937	7,975	696,689	687,525	23,000	19,607	63.5	1,229,476	486,618	328	82	136	24.9		
Minneap., St. P. & S. St. M..1938	4,266	361,444	366,241	3,233	7,244	63.8	433,601	169,179	117	2	24	16.8		
1937	4,277	373,328	379,308	3,641	7,363	63.6	441,924	172,459	125	2	24	15.9		
Northern Pacific .....1938	6,423	598,614	623,206	29,424	18,139	67.4	1,112,978	469,497	332	28	96	21.1		
1937	6,423	603,557	628,406	31,619	17,050	66.6	1,051,147	443,720	327	54	79	17.2		
Central Western Region:														
Alton .....1938	914	182,258	189,461	1,051	3,529	58.5	235,621	90,306	57	16	20	21.5		
1937	912	202,392	208,696	1,305	3,884	57.7	263,659	99,168	71	..	28	28.3		
Ateh., Top. & S. Fe (incl. G.C. & S.F. & P. & S.F.).....1938	13,451	1,728,514	1,841,611	81,624	46,312	59.7	2,999,787	948,044	565	67	280	30.7		
1937	13,538	1,778,979	1,901,513	78,251	46,302	61.7	2,931,126	969,410	602	59	266	28.7		
Chicago, Burl. & Quincy...1938	8,906	1,156,512	1,195,296	39,622	31,722	59.2	2,099,890	825,271	445	37	83	14.7		
1937	8,928	1,213,740	1,247,525	47,2										

1938, Compared with December, 1937, for Roads with Annual Operating Revenues Above \$25,000,000

Region, road, and year	Number of freight cars on line			Per cent un-serv-ice-able	Gross ton-miles per train-hour, excluding locomotives and tenders		Net ton-miles per train-mile	Net ton-miles per loaded car-mile	Net ton-miles per car-day	Car-miles per car-day	Net ton-miles per mile of road per day	Pounds of coal per 1,000 gross ton-miles, including locomotives and tenders	Loco-motive-miles per locomotive-day
	Home	Foreign	Total		Gross ton-miles per train-mile, excluding locomotives and tenders	Net ton-miles per train-mile							
New England Region:													
Boston & Albany.....1938	1,110	3,959	5,069	3.1	18,623	1,173	396	19.7	349	28.1	4,755	184	60.1
1937	2,106	3,750	5,856	26.8	19,551	1,150	382	19.1	270	22.1	4,188	175	53.1
Boston & Maine.....1938	7,248	7,235	14,483	11.8	24,883	1,862	689	21.6	391	27.5	3,069	111	47.4
1937	8,286	6,193	14,479	12.8	25,940	1,859	668	20.6	381	27.9	2,794	108	43.0
N. Y., New Hav. & Hartf...1938	8,500	10,047	18,547	9.4	27,359	1,916	696	20.8	381	29.0	3,974	113	58.7
1937	10,200	8,267	18,467	4.1	25,516	1,784	637	20.2	330	26.0	3,197	112	55.3
Great Lakes Region:													
Delaware & Hudson.....1938	7,835	3,377	11,212	4.0	33,096	2,245	1,068	30.8	675	35.4	8,832	113	42.8
1937	8,137	2,592	10,729	4.0	29,271	2,097	960	29.9	629	35.2	8,344	111	43.1
Del., Lack. & Western.....1938	12,800	5,627	18,427	18.0	36,932	2,057	795	23.3	465	30.8	8,990	142	72.6
1937	13,944	4,211	18,155	14.5	32,223	1,897	726	23.5	436	29.4	8,412	148	71.3
Erie (incl. Chi. & Erie)....1938	18,598	11,877	30,475	5.1	43,091	2,618	1,005	23.7	659	43.2	8,625	106	52.8
1937	20,379	12,527	32,906	5.1	41,800	2,547	949	23.2	595	41.2	8,450	109	53.9
Grand Trunk Western.....1938	5,208	5,225	10,433	14.7	32,879	1,636	560	21.5	412	31.8	4,356	98	76.8
1937	5,335	5,122	10,457	15.3	29,991	1,546	531	21.8	391	30.3	4,107	110	73.8
Lehigh Valley .....1938	11,069	9,648	20,717	6.9	45,749	2,513	1,035	26.5	508	30.6	8,406	124	58.2
1937	12,075	8,994	21,069	9.5	42,314	2,400	992	26.7	486	29.0	8,067	123	51.2
New York Central.....1938	98,345	55,751	154,096	21.2	36,612	2,198	884	27.8	480	30.1	7,011	112	72.6
1937	104,062	57,298	161,360	17.0	35,428	2,141	857	27.7	456	28.8	6,761	113	72.1
N. Y., Chicago & St. Louis.1938	7,665	7,294	14,959	3.7	39,882	2,138	794	23.3	880	61.5	7,509	95	88.3
1937	8,913	6,414	15,327	2.6	37,469	2,038	739	22.8	767	55.8	6,789	98	87.6
Pere Marquette .....1938	10,511	6,158	16,669	3.4	28,457	1,692	626	24.1	401	27.8	3,207	100	74.9
1937	11,154	5,425	16,579	3.8	27,084	1,687	600	23.5	400	29.4	3,174	105	78.4
Pittsburgh & Lake Erie....1938	8,961	8,574	17,535	36.3	42,399	3,044	1,597	45.1	186	7.4	14,481	105	32.8
1937	7,819	8,389	16,208	31.9	43,224	3,320	1,768	44.8	172	6.7	12,725	102	26.2
Wabash .....1938	15,413	8,415	23,828	9.2	38,480	1,857	655	21.3	478	35.2	4,857	126	72.1
1937	14,688	9,130	23,818	5.0	36,198	1,828	637	21.6	490	37.0	4,762	123	69.5
Central Eastern Region:													
Baltimore & Ohio.....1938	60,995	18,042	79,037	24.6	28,289	2,090	921	31.0	487	26.2	6,130	154	49.9
1937	66,870	16,455	83,325	13.1	25,797	1,952	850	30.8	440	24.3	5,775	157	49.7
Central of New Jersey.....1938	9,972	10,429	20,401	30.0	28,303	2,373	1,126	34.1	250	12.4	7,647	136	57.4
1937	10,957	8,912	19,869	28.2	28,418	2,327	1,098	34.5	258	13.0	7,673	149	56.6
Chicago & Eastern Illinois.1938	3,270	3,110	6,380	4.4	28,940	1,580	664	27.8	595	34.5	4,175	133	63.1
1937	3,177	3,136	6,313	1.9	29,101	1,632	703	29.8	644	36.0	4,362	131	59.8
Elgin, Joliet & Eastern.....1938	8,885	3,350	12,235	6.1	16,292	1,906	918	38.5	219	10.0	7,092	127	55.8
1937	9,136	1,755	10,891	3.5	15,808	1,708	811	38.0	209	9.8	5,304	142	52.1
Long Island .....1938	359	2,728	3,087	3.2	5,451	752	292	30.8	78	5.0	695	350	45.7
1937	374	2,406	2,780	3.1	5,458	692	266	30.7	84	5.5	677	335	44.1
Pennsylvania System .....1938	199,873	49,988	249,861	20.8	37,468	2,538	1,087	29.9	357	20.2	8,888	122	52.9
1937	200,100	51,878	251,978	15.3	34,196	2,381	1,025	29.8	336	19.0	8,456	129	52.6
Reading .....1938	25,931	11,014	36,945	22.6	27,099	2,148	1,038	37.1	360	16.6	9,183	139	50.8
1937	26,523	9,261	35,784	12.4	25,446	1,971	933	36.6	346	16.6	8,526	144	54.0
Pocahontas Region:													
Chesapeake & Ohio.....1938	47,773	7,077	54,850	2.0	52,025	3,482	1,864	45.5	816	32.7	15,011	85	56.4
1937	47,579	6,561	54,140	1.3	48,690	3,337	1,782	45.4	813	33.0	14,713	90	55.9
Norfolk & Western.....1938	39,710	4,361	44,071	7.2	51,403	3,340	1,752	42.7	810	32.4	16,178	107	68.1
1937	43,807	4,095	47,902	1.1	46,299	3,060	1,614	42.9	666	26.8	14,292	115	64.5
Southern Region:													
Atlantic Coast Line.....1938	18,458	7,942	26,400	22.3	22,057	1,248	389	19.3	316	29.2	1,581	114	60.6
1937	18,064	7,834	25,898	17.8	21,220	1,232	422	19.8	322	27.6	1,619	117	57.7
Central of Georgia.....1938	5,435	2,249	7,684	2.3	23,211	1,181	445	22.0	460	31.1	1,897	137	70.3
1937	5,574	1,977	7,551	1.6	21,745	1,157	434	22.4	431	29.6	1,723	133	68.7
Illinois Central (incl. Y. & M. V.).....1938	28,856	14,668	43,524	4.0	29,117	1,826	751	27.9	729	44.1	4,818	143	56.2
1937	36,233	15,370	51,603	13.2	27,641	1,744	724	29.4	653	38.9	5,198	145	61.4
Louisville & Nashville.....1938	40,584	8,135	48,719	19.0	25,795	1,667	776	33.3	536	27.6	5,337	137	73.0
1937	42,787	7,934	50,721	10.8	23,046	1,510	714	34.6	510	25.7	5,159	143	75.2
Seaboard Air Line.....1938	12,391	5,402	17,793	3.3	25,657	1,520	547	22.0	547	40.2	2,227	123	66.2
1937	12,103	5,167	17,270	1.4	25,376	1,551	563	22.3	538	39.0	2,148	123	63.0
Southern .....1938	22,265	17,531	39,796	10.5	22,895	1,302	506	23.5	522	35.2	3,197	150	64.4
1937	21,429	16,112	37,541	9.7	21,162	1,241	491	24.2	492	33.2	2,872	158	55.7
Northwestern Region:													
Chicago & North Western..1938	38,105	18,098	56,203	9.8	28,813	1,822	675	24.0	299	20.7	2,050	133	43.3
1937	40,344	18,013	58,357	6.5	25,462	1,681	611	24.0	299	21.1	2,091	135	48.8
Chicago Great Western....1938	2,784	3,368	6,152	2.7	32,522	1,759	598	22.2	848	65.7	3,561	140	101.1
1937	2,897	3,294	6,191	2.3	29,825	1,637	585	22.4	890	65.8	3,684	147	106.9
Chi., Milw., St. P. & Pac..1938	47,265	15,242	62,507	2.9	28,301	1,729	683	26.2	422	27.2	2,419	130	65.7
1937	48,266	15,413	63,679	2.2	25,982	1,632	651	26.5	405	25.8	2,354	135	69.4
Chi., St. P., Minneap. & Om..1938	3,543	5,337	8,880	7.0	18,576	1,354	533	25.3	422	26.8	2,273	124	58.5
1937	4,205	4,998	9,203	6.3	17,740	1,412	591	27.3	467	27.6	2,635	123	60.7
Great Northern .....1938	38,110	8,073	46,183	7.3	30,737	2,007	785	25.8	396	24.7	2,306	129	48.5
1937	38,921	9,190	48,111	5.1	26,373	1,773	702	24.8	327	20.7	1,968	138	45.9
Minneap., St. P. & S. St. M.1938	13,402	3,189	16,591	4.5	20,510	1,200	468	23.4	330	22.1	1,279	116	82.5
1937	13,448	3,341	16,789	3.3	19,591	1,186	463	23.4	336	22.6	1,301	121	82.6
Northern Pacific .....1938	31,610	4,349	35,959	8.6	29,330	1,867	788	25.9	423	24.2	2,358	152	50.4
1937	32,230	4,323	36,553	7.4	26,971	1,747	738	26.0	390	22.5	2,228	161	51.2
Central Western Region:													
Alton .....1938	1,916	5,048	6,964	11.8	32,526	1,299	498	25.6	398	26.6	3,187	132	69.4
1937	2,684	5,306	7,990	11.6	30,177	1,311	493	25.5	383	26.0	3,508	140	72.6
Atch., Top. & S. Fe (incl. G.C. & S.F. & P. & S.F.)..1938	77,715	9,965	87,680	10.9	34,384	1,739	549	20.5	347	28.4	2,274	125	71.8
1937	76,381	11,620	88,001	7.8	31,843	1,651	546	20.9	354	27.4	2,310	129	72.5
Chicago, Burl. & Quincy...1938	31,041	13,498	44,539	5.3	31,993	1,824	717	2					



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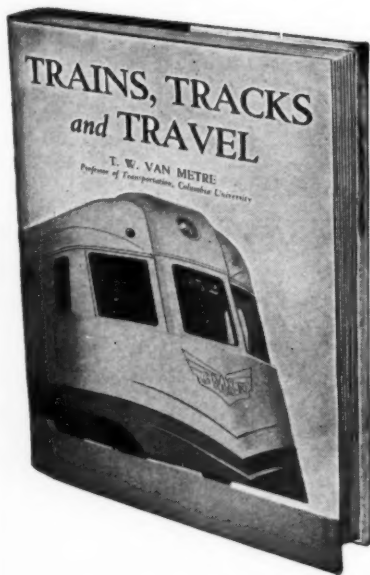
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